Vol. 988 Number 3

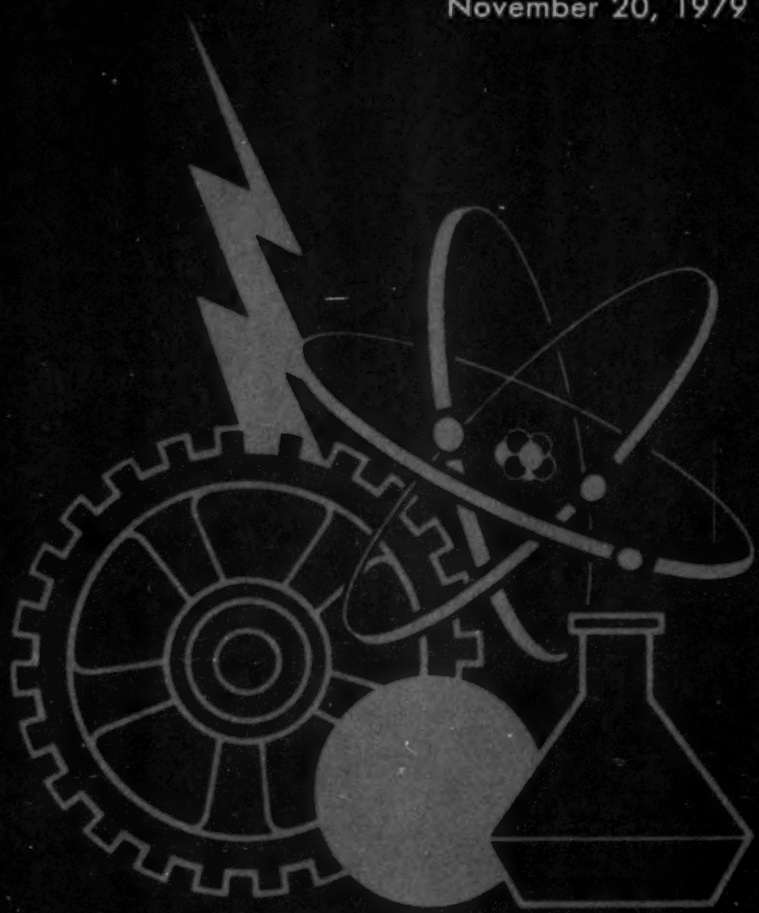
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 20, 1979



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

November 20, 1979 Volume 988 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

July 3, 1979.

Department of the Treasury
United States Customs Service

(TMK-2-R:E:E)

NOTICE OF APPLICATION FOR RECORDATION OF TRADE NAME

OHAUS SCALE CORPORATION

Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name OHAUS SCALE CORPORATION used by Ohaus Scale Corporation organized under the laws of the State of New Jersey, located at 29 Hanover Road, Florham Park, N.J. 07932. The applicant states that the trade name is applied to weighing apparatus, including balances, scales, weights and containers and accessories for same manufactured in the United States.

The applicant states further that no foreign company, parent or subsidiary company is authorized to use the trade name sought to be recorded. Appropriate accompanying papers were submitted with the application.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Any such submission should be addressed to the Commissioner of Customs, Washington, D.C. 20229, in time to be received not later than 30 days from the date of publication of this notice in the FEDERAL REGISTER.

Notice of the action taken on the application for recordation of the trade name will be published in the FEDERAL REGISTER.

DONALD W. LEWIS,
Director, Office of Regulations and Rulings.

Dated: Oct. 22, 1979.

Department of Commerce

Office of the Secretary

PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS; RENEWAL

In accordance with the provisions of the Federal Advisory Committee Act 5 U.S.C. App. (1976) and Office of Management and Budget Circular A-63 of March 1974, and after consultation with GSA it has been determined that the renewal of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in September, 1970. It was reestablished on April 12, 1979 and its present charter will expire on October 12, 1979. Since its inception the purpose of the Committee has been to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing flow of knowledge from the private sector to the government in the field of trademarks. Approximately seventy-five percent of the over one hundred twenty-five specific recommendations have been implemented at least in part. There is no question that the Committee has contributed greatly to the efficiency and effectiveness of the administration of the statute. In reviewing the Committee, the Secretary has sought continued effort towards this objective. The Committee's function cannot be accomplished by any organizational element or other committee of the Department.

As it was initially established, the Committee will continue to comprise the members of the Advisory Committee for Trademark Affairs of the United States Trademark Association. The membership is balanced and is under the control of the President of the Association. The Committee will continue to operate in compliance with the provisions of the Federal Advisory Committee Act.

Copies of the Committee's revised charter will be filed with appropriate committees of Congress.

Any inquiries or comments may be addressed to Patricia M. Davis, Committee Control Officer, Office of Trademark Program Control, U.S. Patent & Trademark Office, Washington, D.C. 20231; telephone (703) 557-3881.

Dated: Oct. 11, 1979.

ELSA O. PORTER,
Assistant Secretary for Administration.

[FR Doc. 79-32087 Filed 10-17-79; 8:45 am]

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,532,247, Re. S.N. 059,396, Filed Jul. 20, 1979, Cl. 220/23.6, INSULATED TRAYS FOR FOOD OR THE LIKE, John A. Bridges, Owner of Record: *Aladdin Industries, Inc., Chicago, Ill.,* Attorney or Agent: Herman Hersh, et al., Ex. Gp.: 241

3,931,094, Re. S.N. 060,424, Filed Jul. 25, 1979, Cl. 260/37 N, FILLED THERMOPLASTIC CONTAINING FIBROUS DISPERSION AID, Leon Segal, et al., Owner of Record: *Allied Chemical Corporation, New York, N.Y.,* Attorney or Agent: Robert J. North, et al., Ex. Gp.: 141

4,028,912, Re. S.N. 059,459, Filed Jul. 20, 1979, Cl. 66/149 R, FABRIC TAKE-UP MECHANISM, Richard Schneck, Owner of Record: *Sulzer Morat GmbH, Bonlanden, Germany,* Attorney or Agent: Robert Osann, et al., Ex. Gp.: 353

4,028,925, Re. S.N. 048,072, Filed Jun. 13, 1979, Cl. 72/294, APPARATUS AND METHOD FOR FORMING BARBED TAPE, Michael R. Mainiero, Owner of Record: *Man Barrier Corporation, Ansonia, Conn.,* Attorney or Agent: Donald J. Hayes, et al., Ex. Gp.: 321

4,029,234, Re. S.N. 048,429, Filed Jun. 14, 1979, Cl. 220/337, PLASTIC HINGE CONSTRUCTION, Edward M. Johnson, Jr., et al., Owner of Record: *The Triangle Corporation, Grant Park, Ill.,* Attorney or Agent: John J. Toney, et al., Ex. Gp.: 241

4,039,373, Re. S.N. 050,291, Filed Jun. 21, 1979, Cl. 162/52, STATIC DISCHARGE DEVICE AND METHOD FOR FIBER DISCHARGE FROM A PRESSURIZED DIGESTER, Johan L. Michelsen, Owner of Record: *American Defibrator Inc., Minneapolis, Minn.,* Attorney or Agent: Eric Y. Munson, Ex. Gp.: 173

4,070,754, Re. S.N. 048,134, Filed Jun. 13, 1979, Cl. 29/449, HAND TOOL FOR JOINING OBJECTS, Michael Bauerkemper, Owner of Record: *Thomas & Betts Corporation, Elizabeth, N.J.,* Attorney or Agent: James J. Daley, et al., Ex. Gp.: 321

4,075,611, Re. S.N. 060,690, Filed Jul. 25, 1979, Cl. 365/2, CONSECUTIVE BIT ACCESS MAGNETIC BUBBLE DOMAIN MEMORY DEVICE, Isoris S. Gergis, Owner of Record: *Rockwell International Corporation, El Segundo, Calif.,* Attorney or Agent: John F. Lynch, et al., Ex. Gp.: 235

4,075,626, Re. S.N. 047,091, Filed Jun. 11, 1979, Cl. 340/388, ALARM BUZZER, Mitsuo Sakaguchi, et al., Owner of Record: *Kobishi Electric Co. Ltd., Tokyo, Japan,* Attorney or Agent: Keith D. Beecher, Ex. Gp.: 234

4,114,036, Re. S.N. 058,198, Filed Jul. 17, 1979, Cl. 250/214 R, LEAK CURRENT SUPPRESSING PRINTED CIRCUIT BOARD, Tokuichi Tsunekawa, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: David Toren, et al., Ex. Gp.: 252

4,147,425, Re. S.N. 058,842, Filed Jul. 7, 1979, Cl. 354/304, PHOTOGRAPHIC PROCESSING ROLLER HAVING A SURFACE ROUGHENED BY ELECTRIC DISCHARGE MACHINING, Harvey S. Friedman, et al., Owner of Record: *Polaroid Corporation, Cambridge, Mass.,* Attorney or Agent: Francis J. Caufield, Ex. Gp.: 211

PATENT NOTICES

Certificates of Correction for the Week of Nov. 20, 1979

Plt. 4,199	4,143,259	4,156,037	4,164,226
Re. 29,296	4,144,052	4,156,258	4,164,307
D. 252,331	4,144,266	4,156,781	4,164,392
3,749,859	4,144,410	4,157,530	4,164,418
3,883,217	4,145,324	4,157,949	4,164,487
3,923,005	4,145,330	4,157,950	4,164,634
3,957,857	4,145,341	4,158,236	4,164,858
3,993,668	4,145,351	4,158,324	4,165,152
4,032,280	4,145,421	4,158,656	4,165,262
4,041,476	4,145,629	4,158,819	4,165,291
4,073,223	4,147,161	4,158,835	4,165,576
4,074,591	4,147,229	4,159,197	4,165,609
4,083,697	4,147,514	4,159,265	4,165,638
4,090,914	4,147,817	4,159,320	4,165,757
4,091,270	4,147,829	4,160,060	4,165,823
4,099,335	4,148,572	4,160,102	4,165,924
4,108,558	4,148,713	4,160,104	4,166,017
4,111,292	4,148,868	4,160,106	4,166,059
4,111,889	4,149,624	4,160,269	4,166,074
4,121,397	4,150,236	4,160,536	4,166,145
4,122,061	4,150,321	4,160,552	4,166,259
4,122,199	4,151,018	4,161,282	4,166,478
4,124,151	4,151,685	4,161,571	4,166,495
4,125,417	4,152,197	4,162,434	4,166,648
4,126,172	4,153,552	4,162,729	4,166,777
4,127,412	4,153,676	4,162,828	4,166,984
4,128,537	4,153,687	4,162,854	4,167,043
4,131,729	4,153,864	4,162,916	4,167,057
4,131,948	4,154,244	4,162,967	4,167,101
4,134,041	4,154,295	4,162,973	4,167,286
4,136,699	4,154,521	4,163,198	4,167,468
4,137,222	4,154,764	4,163,291	4,167,483
4,138,464	4,154,899	4,163,604	4,167,778
4,138,998	4,155,131	4,163,855	4,167,836
4,141,027	4,155,869	4,163,950	4,167,857
4,141,153	4,155,992	4,164,197	

Disclaimers

3,361,298.—*John G. Trumble,* Big Rapids, Mich. CAMPING UNIT FUEL TANK FILLER SPOUT CAP ASSEMBLY. Patent dated Jan. 2, 1968. Disclaimer filed Aug. 24, 1979, by the inventor.

Hereby enters this disclaimer to claim 3 of said patent.

3,634,874.—*Raymond J. Mason,* Lynwood, Calif. TRIAC MOTOR SPEED CONTROL. Patent dated Jan. 11, 1972. Disclaimer filed Aug. 27, 1979, by the assignee, *Minarik Electric Company.*

Hereby enters this disclaimer to claim 1 of said patent.

3,678,225.—*Harold D. Hulterstrum,* Barbaboo, Wis. REPEAT CYCLE TIMER OF MODULAR CONSTRUCTION WITH IMPROVED ADJUSTABLE CAM. Patent dated July 18, 1972. Disclaimer filed July 6, 1979, by the assignee, *Gulf & Western Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 15, 18 and 21 of said patent.

4,152,796.—*Isaac Fogel,* Silver Spring, Md. WATERBED MATTRESS. Patent dated May 8, 1979. Disclaimer filed Sept. 5, 1979, by the assignee, *Classic Products Corporation.*

The term of this patent subsequent to Mar. 27, 1996, has been disclaimed.

4,161,057.—*Daniel Joseph, Jr., II,* Ojo, Caliente, N. Mex. ANTI-VANDALISM NUT ASSEMBLY AND METHOD OF ASSEMBLING SAME. Patent dated July 17, 1979. Disclaimer filed Sept. 19, 1979, by the assignee, *Roland C. Zinn.*

Hereby enters this disclaimer to claims 1, 3, 4 and 6 of said patent.

4,162,680.—*Lester Coch,* Northport, N.Y. NON-POLLUTING SYSTEM FOR METAL SURFACE TREATMENTS. Patent dated July 31, 1979. Disclaimer filed Sept. 25, 1979, by the assignee, *Waldes Kohinoor, Inc.*

The term of this patent subsequent to Dec. 13, 1994, has been disclaimed.

4,165,208.—*Ingemar H. Lundquist,* Oakland, Calif. INTRAVENOUS DELIVERY PUMP. Patent dated Aug. 21, 1979. Disclaimer filed Sept. 19, 1979, by the assignee, *Valleylab.*

The term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Dedication

4,161,159.—*Basil K. J. Leong,* Portage, Mich. INSTANTANEOUSLY EMPTIABLE EXTERNALLY MOUNTED ANIMAL FOOD TRAY. Patent dated July 17, 1979. Dedication filed June 25, 1979, by the assignee, *International Research & Development Corporation.*

Hereby dedicates to the Public the entire term of said patent.

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,723,474, E. G. Teach, D. R. Arneklev, METATHIOCARBAMYL PHENYLENE AMIDES AND UREAS AND THEIR UTILITY AS HERBICIDES, Interference No. 99,896, decided August 16, 1979, claims 14, 17 and 22.

Patent No. 3,799,915, W. R. Dunnavant, E. M. Harris, P. F. Kurz, R. A. Markle, E. H. Parker, PHOTOPOLYMERS, Interference No. 98,978, decided June 12, 1979, claims 17, 18, 22 and 23.

Patent No. 3,802,115, C. A. Auten, R. A. Fischer, L. H. Fischer, NOISE MAKING FISHING LURE AND METHOD THEREOF, Interference No. 99,470, decided July 3, 1979, claim 4.

Patent No. 3,840,533, J. E. Dolfini, E. Bohme, 7-SUBSTITUTED CEPHALOSPORANIC ACID AND DERIVATIVES, Interference No. 99,162, decided June 1, 1979, claims 1 and 2.

Patent No. 3,852,642, J. C. Engel, R. T. Elms, J. J. Misencik, SENSING AMPLIFIER AND TRIP CIRCUIT PARTICULARLY FOR GROUND FAULT CIRCUIT INTERRUPTER, Interference No. 99,353, decided June 19, 1979, claims 3, 13, 19–21.

Patent No. 3,852,678, G. J. Frye, PUSH-PULL AMPLIFIER WITH CURRENT MIRRORS FOR DETERMINING THE QUIESCENT OPERATING POINT, Interference No. 99,404, decided June 25, 1979, claims 1–3 and 5.

Patent No. 3,855,781, H. Chihara, Y. Ushiyama, STEP MOTOR MECHANISM FOR ELECTRONIC TIMEPIECE, Interference No. 99,370, decided May 23, 1979, claims 1, 2 and 12.

Patent No. 3,860,322, E. L. Sankey, T. J. Holtgrieve, SEALED ELECTRICAL CONNECTOR, Interference No. 99,278, decided June 4, 1979, claims 1 and 2.

Patent No. 3,883,213, F. J. Glaister, CONNECTORS, Interference No. 99, 287, decided May 30, 1979, claims 1, 4–9.

Patent No. 3,895,094, J. L. Carter, M. T. Chapman, B. G. Yoakam, PROCESS FOR SELECTIVE REDUCTION OF OXIDES OF NITROGEN, Interference No. 99,622, decided July 16, 1979, claim 2.

Patent No. 3,899,025, R. W. Dinning, PUMP DOWN SYSTEM FOR PLACING AND RETRIEVING SUBSURFACE WELL EQUIPMENT, Interference No. 99,476, decided April 26, 1979, claims 1–9, 12, 14–21.

Patent No. 3,907,903, Y. G. Chang, P. S. Bailey, ORGANIC PEROXIDES, Interference No. 100,084, decided June 14, 1979, claim 1.

Patent No. 3,925,223, R. L. Coffman, R. W. Shiffler, HYDRAULIC FLUIDS BASED ON BORATE ESTERS, Interference No. 99,418, decided September 10, 1979, claims 1–6.

Patent No. 3,927,017, J. Heeres, L. J. J. Backx, J. H. Mostmans, 1-(BETA-ARYL-BETA-R-ETHYL)IMIDAZOLES, Interference No. 99,966, decided July 31, 1979, claims 1–4.

Patent No. 3,930,829, J. E. Sensi, MOVABLE DAM BARRIERS FOR USE IN THE MANUFACTURE OF A GLASS RIBBON ON A MOLTEN METAL BATH, Interference No. 99,420, decided March 13, 1979, claims 14, 15, 19 and 23.

Patent No. 3,966,042, L. S. Shelton, R. A. M. Golsch, D. G. Boigk, FASTENER STRIP, Interference No. 99,802, decided June 11, 1979, claim 5.

Patent No. 3,973,077, A. Classon, BUSHING FOR ELECTRICAL CONNECTION, Interference No. 99,867, decided June 7, 1979, claims 1–4, 6 and 7.

Patent No. 3,995,635, T. Higuchi, A. A. Hussain, J. W. Sheil, OCULAR INSERT, Interference No. 100,051, decided July 11, 1979, claims 1, 5 and 7.

Patent No. 4,014,758, S. Kawai, Y. Yamagiwa, M. Mizusawa, H. Watanabe, Y. Ando, M. Takahashi, CONTINUOUS ELECTROLYTICAL TREATMENT OF ALUMINUM OR ITS ALLOYS, Interference No. 99,847, decided August 16, 1979, claims 1–5 and 9.

Patent No. 4,045,435, G. A. Koppel, PREPARATION OF CEPHALOSPORIN ETHERS, Interference No. 100,153, decided July 16, 1979, claims 1–5.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 20, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-12-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	11-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-2-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-5-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-23-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	7-10-78

Expiration of patents: The patents within the range of numbers indicated below expire during October 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,056,137 to 3,061,832, inclusive
Plant Patents..... Numbers 2,178 to 2,188, inclusive

REISSUES

NOVEMBER 20, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,151

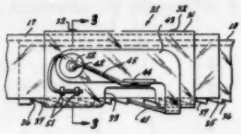
ADJUSTABLE BED-FRAME

Richard A. Nowell, Carlsbad, Calif., assignor to Harris-Hub Co., Inc., Harvey, Ill.

Original No. 4,078,270, dated Mar. 14, 1978, Ser. No. 768,331, Feb. 14, 1977. Application for reissue May 16, 1978, Ser. No. 906,769

Int. Cl.[2] **A47C** *19/04*

U.S. Cl. 5—181 **12 Claims**



1. In an adjustable bed frame adapted to support a box spring and mattress,

a pair of spaced parallel [horizontal] *horizontally* disposed side frame members;

at least one horizontally disposed transverse frame member comprising two elongated elements;

one of said elements mounted by one of its ends to one of said side frame member and the other of said elements mounted by one of its ends to the other of said side frame members;

said other element having a series of teeth disposed substantially along its length;

a spring-loaded pawl mounted on said one element [near its free end];

said one element and said other element being disposed in slidable relationship to each other so that said pawl engages said teeth one at a time, *said teeth facing in a direction such that said pawl is free to ride over said teeth when said side frame members are moved inwardly toward one another, engagement between said pawl and one of said teeth preventing said side frame members from moving outwardly relative to one another.*

Re. 30,152

SWINGABLE SHIELD ASSEMBLY FOR TRACTOR POWER TAKE-OFF

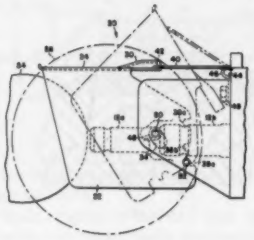
Lewis K. Davis, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Original No. 4,008,583, dated Feb. 22, 1977, Ser. No. 606,361, Aug. 21, 1975. Application for reissue Oct. 23, 1978, Ser. No. 953,487

Int. Cl.[2] **F16D** *3/84*

U.S. Cl. 64—32 R **8 Claims**

1. A PTO shield assembly for a tractor having a PTO shaft protruding therefrom, comprising: an inverted, U-shaped, shield member extending above and to the sides of the PTO shaft and secured to the tractor for pivotation about a horizontal axis perpendicular to the axis of the PTO shaft; said shield member having orientation means provided therein for establishing a plurality of *operative* pivotable positions for the shield member; and holding means on the tractor engageable with the



orientation means for holding the shield member pivoted in *any* one of the plurality of pivotable positions.

Re. 30,153

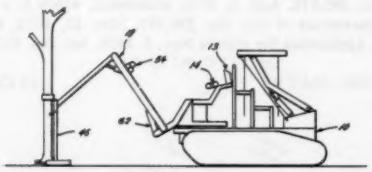
TREE HARVESTER

Thomas N. Busch, Daphne, Ala., and Cyrus E. Hoadley, Olla, La., assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Original No. 3,556,183, dated Jan. 19, 1971, Ser. No. 739,766, Jun. 25, 1968. Application for reissue May 3, 1971, Ser. No. 139,345

Int. Cl.[2] **A01G** *23/02*

U.S. Cl. 144—3 D **25 Claims**



1. A tree harvester comprising:

a base;

a buck shear mounted on said base for bucking a tree into sections;

upwardly facing means for engaging a tree moving through said buck shear;

an articulating boom having inner and outer arms mounted on said base;

means on said outer arm for grasping a tree;

downwardly facing means mounted on said boom for engaging a tree moving through said buck shear when the boom is retracted;

means for extending said boom and operating said grasping means to engage a tree and for retracting the boom to retracted position in which the tree is engaged by said upwardly and downwardly facing means;

said upwardly and downwardly facing means together with said grasping means aligning the tree for movement through the buck shear; and

means for feeding the tree through said buck shear.

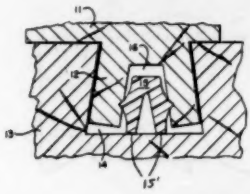
Re. 30,154
JOINING

Arthur B. Jarvis, Andover, Mass., assignor to Bose Corporation, Framingham, Mass.

Original No. 4,042,307, dated Aug. 16, 1977, Ser. No. 719,942, Sep. 2, 1976. Application for reissue Oct. 25, 1977, Ser. No. 845,256

Int. Cl.[2] **F16B** *2/14*

U.S. Cl. 403—290 **5 Claims**



1. A joint comprising,
a first piece of material having a projection with a groove,
a second piece of material having a slot embraced by angled walls with the width of the slot opening slightly greater than the width of said projection and less than the slot width at its base,
and wedge means located within said slot and said groove, for expanding said groove and urging said projection into engagement with the walls beside said slot,
said wedge means being formed with a slit having an opening adjacent to the base of said slot.

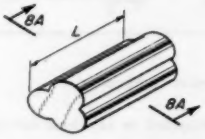
Re. 30,155
HYDROTREATING OF PETROLEUM DISTILLATES USING SHAPED CATALYST PARTICLES

William R. Gustafson, Lincroft, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Original No. 3,990,964, dated Nov. 9, 1976, Ser. No. 580,865, May 27, 1975. Continuation-in-part of Ser. No. 508,780, Sep. 24, 1974, Pat. No. 3,966,644, which is a continuation-in-part of Ser. No. 385,519, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 255,491, May 22, 1972, abandoned. Application for reissue Nov. 3, 1978, Ser. No. 957,609

Int. Cl.[2] **C10G** *23/02*

U.S. Cl. 208—216 PP **22 Claims**



12. In a process for hydrotreating petroleum distillate to remove sulfur-containing and nitrogen-containing components by contacting said distillate with hydrogen under pressure, temperature and hydrogen flow rate suitable for such hydrotreating, and with porous hydrotreating catalyst particles comprising a major portion of alumina and hydrotreating promoting amounts of molybdenum oxide and other oxide selected from cobalt oxide, nickel oxide and mixtures thereof, the improvement wherein said catalyst particles having a given length and polylobal cross-sectional shape characterized by a concavity index greater than 1.0, a void fraction in the range of about 0.25 to 0.60, ratio of geometric volume to geometric surface in the range of about **0.001** to **0.042** inch and catalytic pore volume between about **0.35** and **0.85** cubic centimeters per gram, said pore volume resulting from a major portion of pores having a diameter in the range of about **40** to **90** angstrom units when measured with mercury up to **50,000** pounds per square inch absolute pressure and a contact angle of **140°**.

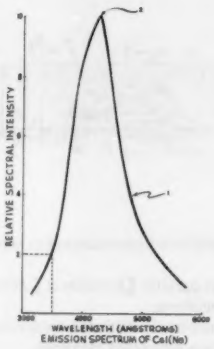
Re. 30,156
SODIUM ACTIVATED CESIUM IODIDE SCINTILLATOR

Paul C. Brinckmann, Munster, Fed. Rep. of Germany, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Original No. 3,446,745, dated May 27, 1969, Ser. No. 531,455, Mar. 3, 1966. Continuation of Ser. No. 364,833, May 29, 1973, abandoned. Application for reissue Mar. 18, 1976, Ser. No. 668,129

Int. Cl.[2] **C09K** *11/24*

U.S. Cl. 252—301.4 H **2 Claims**



1. A scintillator comprising a transparent optically integral [crystalline] *single crystal* material consisting of a major amount of cesium iodide and a minor amount of a sodium compound *in solid solution therein,* said material being characterized by having an emission peak at about 4200±100 angstrom units *wherein the sodium concentration is from about 0.01 mole percent to about 0.220 mole percent.*

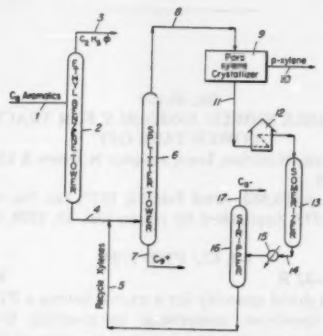
Re. 30,157
XYLENE ISOMERIZATION

George T. Burress, Somerville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Original No. 3,856,873, dated Dec. 24, 1974, Ser. No. 397,194, Oct. 13, 1973. Application for reissue Dec. 19, 1977, Ser. No. 861,814

Int. Cl.[2] **C07C** *5/24*

U.S. Cl. 585—411 **5 Claims**



1. In a process for conversion of a mixture of aromatic compounds having eight carbon atoms, said mixture containing

ethyl benzene and xylenes, to isomerize xylenes contained in said mixture and convert at least part of ethyl benzene so contained to xylene or to compounds readily separable by distillation from eight carbon atom aromatics; the improvement which comprises contacting such mixture of eight carbon atom aromatic compounds with a catalyst which comprises acid zeolite of the ZSM-5 type, acid zeolite ZSM-12 [or acid zeolite ZSM-21], *acid zeolite ZSM-35 or acid zeolite ZSM-38* in vapor phase and in the absence of added hydrogen at a temperature of about 500° F. to about 1,000° F.

Re. 30,158

FUSING RESISTOR

James B. Bucklin, Brazil, and Jay Utken, Frankfort, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Original No. 3,735,318, dated May 22, 1973, Ser. No. 195,689, Nov. 4, 1971. Application for reissue Oct. 9, 1974, Ser. No. 513,454

Int. Cl.[2] **H01H** *85/06*

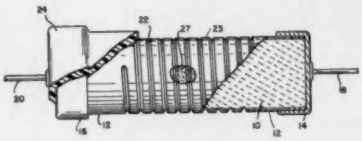
U.S. Cl. 337—166 **13 Claims**

1. A resistor comprising:

a non-conductive substrate,

a resistive tin oxide based film on said substrate,

a layer of glass frit material disposed on at least a portion of said resistive tin oxide based film having a melting point below the melting point of said resistive film which when melted chemically reacts with said film to render said portion thereof non-conductive,



metallic caps disposed at opposed ends of said substrate and overlying said film,

electrical leads coupled to said end caps, and

an insulative cover substantially surrounding said film and said caps.

PLANT PATENTS

GRANTED NOVEMBER 20, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,485

RASPBERRY PLANT

J. Miles Reiter, 315 Vista Dr., La Selva Beach, Calif. 95076

Filed May 9, 1978, Ser. No. 904,150

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—46 **1 Claim**

1. The new and distinct variety of raspberry plant herein described and illustrated and identified by the characteristics enumerated above.

4,486

RASPBERRY PLANT

J. Miles Reiter, 315 Vista Dr., La Selva Beach, Calif. 95076

Filed May 9, 1978, Ser. No. 904,151

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—46 **1 Claim**

1. The new and distinct variety of raspberry plant herein described and illustrated and identified by the characteristics enumerated above.

4,487

STRAWBERRY PLANT

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 953,815

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,488

STRAWBERRY PLANT

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 953,816

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,489

STRAWBERRY PLANT

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 953,993

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

PATENTS

GRANTED NOV. 20, 1979

ERRATA

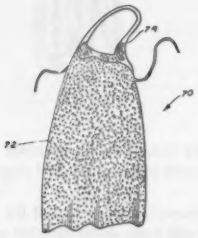
For CLASS	See PATENT NO.
433–053	4,174,570
433–216	4,174,571
340–052 D	4,174,766
435–032	4,174,772
406–076	4,174,868
425–501	4,174,945
430–375	4,174,968
430–445	4,174,969
435–055	4,175,006
435–105	4,175,007
435–295	4,175,008
528–299	4,175,072
548–140	4,175,081
549–065	4,175,085
549–051	4,175,086
549–059	4,175,088
585–831	4,175,099
525–327	4,175,100
525–088	4,175,101
526–309	4,175,176
342–303	4,175,251

PATENTS

GRANTED NOVEMBER 20, 1979

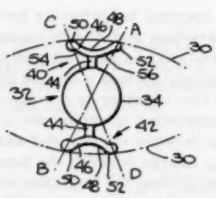
GENERAL AND MECHANICAL

4,174,542
TEXTURED APRON
Maris Vistins, Coshocton, Ohio, assignor to Becton, Dickinson and Company, Rutherford, N.J.
Division of Ser. No. 817,189, Jul. 20, 1977, which is a division of Ser. No. 767,849, Feb. 11, 1977, Pat. No. 4,089,069. This application Nov. 2, 1978, Ser. No. 957,136
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—48 **4 Claims**



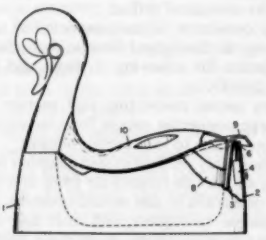
1. An abrasion resistant, wrinkle finish textured apron, which comprises;
- a knitted textile body having the shape and size of an apron, an outer surface of which is napped to provide raised textile fibers, the raised fibrous naps having a height of from ¼ inch to 1 inch to create an uneven base on said body; and
- a cured, elastomeric resin coating the base to encapsulate individual nap fibers, whereby the coating is reinforced and strengthened by the included encapsulated fibers and a wrinkle finish is obtained.

4,174,543
INTRAOCULAR LENSES
Charles D. Kelman, 73 Bacon Rd., Old Westbury, N.Y. 11568
Filed Jun. 1, 1978, Ser. No. 911,452
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **16 Claims**



1. An intraocular insert suitable for use as an artificial lens implant in the anterior chamber of a human eye, said anterior chamber having a groove between the scleral spur and the iris of the eye circumferentially and at upper and lower portions of the eye when viewed in cross section, said insert having a medial light focusing lens body having a periphery and generally oppositely disposed first and second position fixation means engageable with said respective upper and lower groove portions to fix the position of the lens body with respect to the pupil of the eye, said upper and lower groove portions having respective interior peripheral surfaces, said first and second position fixation means being integrally joined to predetermined first and second peripheral portions respectively of said lens body and respectively extending generally radially outwardly of said lens body, said first and second position fixation means respectively having first and second outer seating edges, each said outer seating edge respectively having a pair of spaced contact portions for paired contact with a respective one of said interior peripheral surfaces of said groove and a concave portion between said pair of contact portions that is normally free from contact with said respective ones of said interior peripheral surfaces of said groove, at least one of the position fixation means having a first stem portion integrally joined to and extending from one of said peripheral portions of said lens body, and a first limb portion joined to and extending from said first stem portion and including at least one free end having one of said contact portions, said first limb portion having a first radially outermost peripheral edge that defines one of said outer seating edges and a first inner edge free from connection with said lens body from said first stem to said one of said contact portions, at least one of said first stem portion and said first limb portion being of a first predetermined width and thickness to permit movement of said one of said contact portions toward and away from said lens body in response to normal distortions of the eye.

4,174,544
STOOL FOR USE WITH INFANT
Noriko Furusawa, 1439, Torii-Atomachi, Kanuma-shi, Tochigi-ken, Japan
Filed Jun. 12, 1978, Ser. No. 914,543
Int. Cl.[2] A61G *9/00*
U.S. Cl. 4—112 **2 Claims**



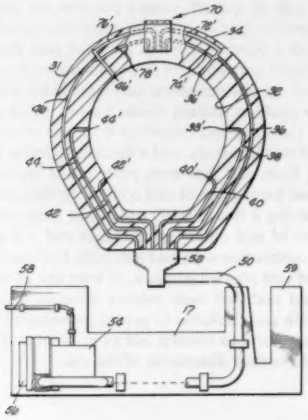
1. A stool for use with infants which is portable and used in sit-astride fashion comprising:
- a bed pan having a bottom surface and an extended side edge with an undersurface,
- a straddle seating body having a base portion and a lid with a center opening, said base portion having an inner peripheral wall and an outer peripheral wall, said bed pan being rockably carried in said base portion,
- a music box mounted between said inner and outer perpheral walls having a rotatable governor,
- a stopper rod having two ends longitudinally movably mounted in said base portion, one end being in contact with said undersurface of said side edge and the other end being in rotation-blocking contact with said governor, and
- a spring biasing said stopper rod into contact with said governor whereby when an infant is placed astride said lid, said stopper rod is pushed downwardly against the biasing of said spring unblocking said governor and allowing the same to rotate to sound said music box.

4,174,545

TOILET STOOL VENTILATING DEVICE

Clarence E. Smith, Jr., 1372 E. 107th St., Los Angeles, Calif. 90002

Filed Jul. 31, 1978, Ser. No. 929,721
Int. Cl.[2] A47K *13/00*; E03D *9/04*
U.S. Cl. 4—217 **2 Claims**



1. A ventilating device for a toilet stool having a toilet bowl and a seat pivotally connected thereto, said bowl having an enlarged opening, comprising:

an air chamber means adapted to fit the top of said bowl and positioned between said seat and said bowl, said chamber means having an inner wall adjacent said enlarged opening, said inner wall having a plurality of orifices spaced around the exterior thereof to receive air from said bowl, said chamber means having a plurality of conduits therein, said conduits being respectively connected to said orifices such that each conduit defines a separate flow passage from the associated orifice;

discharge connector means connected to said conduits for receiving air discharged from said conduits;

suction means for removing air from said bowl to remove odors therefrom;

conveying means connecting said suction means and said discharge connector means for conveying air from said chamber means to said suction means;

a valve moveably secured in said chamber means, said valve having an inlet to receive air from said bowl, said valve being connected to one of said conduits, said valve being positionable to register said inlet and said one of said conduits to allow flow of air from said bowl into said chamber means and to move said inlet out of registration with said one of said conduits; and

switch means operably connected to said suction means to selectively actuate said suction means.

4,174,546

CONSTRUCTION FOR A WATER CLOSET

Toshiro Ohtake, No. 1-5, Tateishi 6-chome, Katsushika-ku, Tokyo, Japan

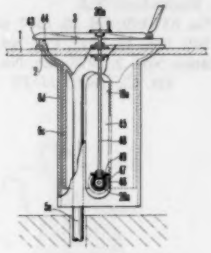
Filed Nov. 23, 1977, Ser. No. 854,314
Claims priority, application Japan, Nov. 27, 1976, 51-143170; Jan. 18, 1977, 52-004165; Apr. 9, 1977, 52-095400
Int. Cl.[2] E03D *11/02, 11/16, 1/00*
U.S. Cl. 4—420 **6 Claims**

1. A toilet for human waste, adjustably positionable on a support at floor level comprising:

an outer tubular drum member connected to the support and extending downwardly therefrom;

a stool member supported on said outer drum including a seat and bowl portion and a tubular drum portion extending downwardly from said bowl portion, said drum portion comprising an inner drum member concentrically slidable in said outer drum member;

said outer drum member including at least one elongated slot therein having an internal vertical rack formed along one elongated edge thereof;



a shaft rotatably mounted on said inner drum member;

a pinion connected to said shaft and engaged with said rack; and

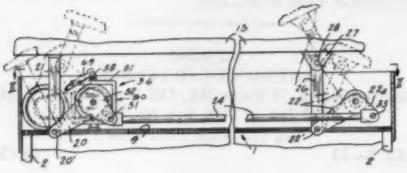
drive means connected to said shaft for rotating said pinion and moving said inner drum member upwardly and downwardly with respect to said outer drum member.

4,174,547

HOSPITAL BED STRUCTURE

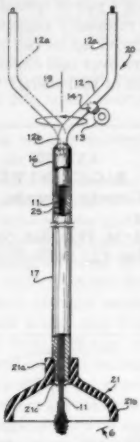
Justin J. Wetzler, 703 Sheridan Rd., Evanston, Ill. 60202

Filed Feb. 8, 1978, Ser. No. 876,017
Int. Cl.[2] A47C *3/32, 7/10*
U.S. Cl. 5—68 **21 Claims**



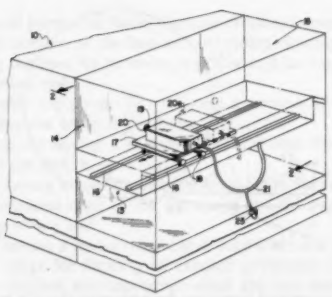
1. In power operated bed structure having a relatively stationary base structure and a mattress-supporting structure, having a head end and a foot end, adapted to support a mattress in a planar position, in which it may be elevated and lowered relative to the base structure by corresponding movement of said mattress-supporting structure, the combination of connecting linkage between the foot end and the base structure and connecting linkage between the head end and the base structure, for supporting the respective ends in elevated or in lowered positions, power means carried by the base structure operatively connected to one of said linkages, for elevating and lowering the associated end of the mattress-supporting structure, means for selectively connecting the other of said linkages to the power source for simultaneous actuation of such other linkage with the first-mentioned linkage, a mattress, while supported in such a planar position, whereby the mattress-supporting structure may be elevated and lowered relative to the base structure, and means for retaining the end of the mattress-supporting structure associated with said other linkage, in position independently of its connection to the power source, whereby such end of the mattress-supporting structure may be disposed in a lowered position relative to the opposite end thereof to tilt the plane of a mattress supported by said mattress structure.

4,174,548
PLUMBER'S APPLIANCE FOR CLEARING DRAINS
Richard P. Dunn, 3437 Davies Ave., Cayucos, Calif. 93430
Filed Jan. 12, 1978, Ser. No. 868,996
Int. Cl.[2] B08B *9/02*
U.S. Cl. 15—104.3 SN **4 Claims**



1. A plumber's appliance for clearing drains and the like comprising an elongate flexible clean-out cable, an elongate rigid hollow handle carried on said cable, said handle having first and second portions to be gripped and rotated about the axis of the other said portion for rotating said cable on said axis, an elongate hollow grip member carried about a stretch of said cable for steadying the cable on said axis as said cable is rotated by said handle, a first end of said hollow grip member having aligning means for engaging and guiding said other one of said portions while permitting said one of said portions to be rotated around said axis, a resilient force cup carried from that end of said grip member opposite said first end thereof, said cable being disposed to pass centrally through said force cup, said grip member being movable axially of said stretch of said cable for operating said force cup with said cable disposed axially of said grip member, and means for substantially blocking fluid flow out of said grip member under plunging action of said force cup.

4,174,549
SOOT BLOWING APPARATUS
Herb Michelson, 5 Horizon Rd., Fort Lee, N.J. 07024
Filed Oct. 25, 1977, Ser. No. 844,859
Int. Cl.[2] F23J *3/02*
U.S. Cl. 15—318 **15 Claims**



1. A soot blowing system for cleaning banks of tubes or the like disposed in an apertured housing having a plurality of insertion apertures comprising:

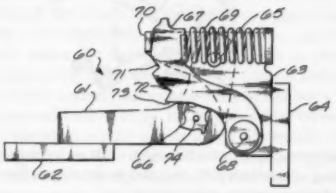
a moveable carriage located exteriorly of said housing,

an apertured lance having an apertured portion containing at least one fixedly positioned emission opening,

means for rotatably and axially displacing said lance relative to said moveable carriage for sequential insertion of said lance into and rotation within said insertion apertures in the housing to pass in proximity to said banks of tubes, and

means for connecting said lance to a fluid supply, said lance being rotatable about its own axis to emit fluid under pressure through its apertured portion for cleaning the tubes in the adjacent spatial area of the emission of the fluid.

4,174,550
DETENT FOR MECHANICAL LINKAGE
George H. Hurst, Jr., 16491 Harbour La., Huntington Beach, Calif. 92649
Continuation of Ser. No. 775,780, Mar. 9, 1977, Pat. No. 4,090,273. This application May 23, 1978, Ser. No. 908,723
The portion of the term of this patent subsequent to May 25, 1995, has been disclaimed.
Int. Cl.[2] E05D *11/06, 11/08*
U.S. Cl. 16—144 **1 Claim**



1. A detent for a mechanical linkage comprising:

a movable linkage member;

a rotatable cam follower member;

a generally V-shaped notch with edges and a vertex formed on one of the members;

first and second sides on the other member meeting to form a corner that fits in the notch;

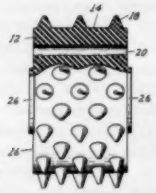
means for urging the cam follower member and the surface of travel of the linkage member against each other; and

an arcuate concave relief on the first side of the other member adjacent to the corner, the relief being shaped to embrace one edge of the notch without such edge bottoming on the other member as the corner of the other member enters the notch from a given direction.

4,174,551
FEATHER PLUCKING DEVICE
Scott W. McKendree, 1893 Del Moro, Klamath Falls, Oreg. 97601
Filed Jan. 3, 1978, Ser. No. 866,568
Int. Cl.[2] A22C *21/02*
U.S. Cl. 17—11.1 R **2 Claims**

1. A feather plucking device comprising a resilient drum having opposed, substantially parallel sides, a central aperture extending from side-to-side through a central region of said drum, a plurality of angularly-spaced apertures extending from side-to-side through a peripheral region of said drum, and a pair of bosses, each formed integrally with the central region of a side of the drum and extending outwardly therefrom about said central aperture, said drum being designed for detachable mounting on a rotatable shaft extending through said central aperture by opposing washers pressed against the bosses on

opposite sides of the drum to frictionally inhibit rotation of the drum relative to the shaft, said bosses allowing said washers to



be pressed tightly against said central region with minimum side-to-side deformation of said peripheral region occurring.

4,174,552

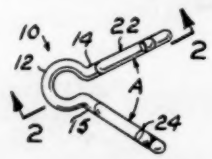
DRAPERY TIEBACK RING HOLDING CLIP

Edna M. Franklin, 1500 NW. 35, Oklahoma City, Okla. 73118

Continuation-in-part of Ser. No. 855,860, Nov. 30, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 914,245

Int. Cl.[2] A44B *13/00*

U.S. Cl. 24—73 CH **3 Claims**



1. A support clip in combination with a drapery panel tieback having an endless ring secured to its respective end portions, the improvement comprising:

an elongated rod having its medial portion arcuately curved in a flat plane to form a part circular screw retaining loop and having intermediate portions disposed in diverging relation in the plane of the screw loop,

the respective end portions of said rod being arcuately curved toward the screw loop to form an open loop lying in a plane normal to the plane of the screw loop for respectively receiving said endless rings.

4,174,553

COUPLING DEVICE FOR ANIMAL COLLARS

Benton Schrougham, 243 S. 25th St., Beech Grove, Ind. 46107, and John W. Lee, 7791 W. 96th St., Zionsville, Ind. 46077

Filed Sep. 15, 1978, Ser. No. 942,459

Int. Cl.[2] A44B *11/00*

U.S. Cl. 24—74 R **6 Claims**

1. In a coupler device for fastening an animal collar provided with an opening near each end of said collar, the combination of a base member having upstanding, longitudinally extending side portions defining the width of a channel and including a post member disposed near each end of said channel and upraised from the lower surface of said base member, each of said post members including a stop means and adapted to receive a respective one of said openings provided near the respective ends of said collar; a locking member comprising a strip of resilient material having a convex curvature along its longitudinal axis and including a pair of spaced openings; a respective one of said openings releasably engaging a respective one of said said stop means provided on said post members with said strip forming a closure over said channel and preventing displacement of the ends of said collars from a respective post member.

4,174,554

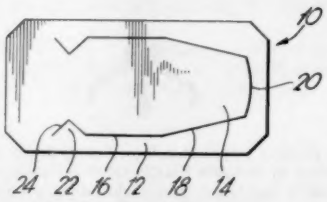
BAG CLOSURE

Gysbertus Flantua, Grimsby, Canada, assignor to Bonar & Bemis Ltd., Canada

Filed Jul. 14, 1978, Ser. No. 924,725

Int. Cl.[2] B65D *77/10*

U.S. Cl. 24—30.5 P **2 Claims**



1. A reusable bag closure comprising a base portion and a tongue portion formed from the base portion, said tongue portion having an integral hinge connection with said base portion and being defined by a pair of opposed inwardly directed neck areas adjacent said connection, a pair of opposed parallel edge sections connected to said neck areas, a pair of opposed converging edge sections connected to said parallel edge sections and a curved end section connecting said converging edge sections, said base portion having an opening corresponding to said tongue portion, said opening having a minimum width substantially equal to the minimum distance between said neck areas.

4,174,555

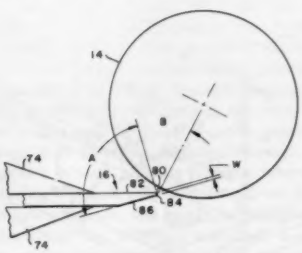
BLADE FOR SCULPTURING PILE FABRIC

Charles E. Willbanks, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 8, 1978, Ser. No. 904,109

Int. Cl.[2] D06G *23/02*

U.S. Cl. 26—16 **8 Claims**



1. An improved apparatus for trimming the pile in regions of a pile fabric to which stiffening agent has been applied, said apparatus being of the type having;

means for supplying a pile fabric having regions of stiffened and regions of unstiffened fibers; and

cutter means for trimming the pile from the stiffened regions including

blade means comprising an endless translating band for contacting both the stiffened fibers and the unstiffened fibers while severing the stiffened fibers and deflecting the unstiffened fibers, said blade means cutting in the same fashion as a knife or razor as opposed to cutting like a pair of scissors;

support means closely adjacent to said blade means for maintaining said pile fabric in contact with said blade means; and

means for effecting relative motion between said blade means and said pile fabric,

wherein the improvement comprises said blade having

a face adjacent to said pile fabric,

a first facet disposed between the leading edge of said blade and said face adjacent to said pile fabric, and

a second facet adjoining said first facet said second facet being substantially wider than said first facet, the intersection of said first facet and said second facet defining the leading edge of said blade, said leading edge being between said second facet and said pile fabric, the angle between said face and said first facet being acute, the angle between said first facet and the normal to said pile fabric adjacent to said blade being between about 30° and about 60°, the included angle defined by said first facet and said second facet being between about 75° and between 105° and the width of said first facet being less than about $\frac{1}{3}$ the depth of the pile on said pile fabric.

4,174,556

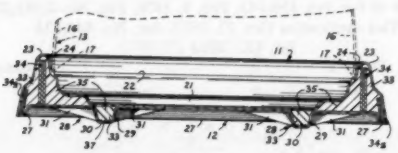
CASKET

Richard R. Richings, E. 1707 Bismark, Spokane, Wash. 99207

Filed Nov. 16, 1977, Ser. No. 852,110

Int. Cl.[2] A61G *17/00*

U.S. Cl. 27—7 **12 Claims**



1. A casket comprising:

a base molded of synthetic resin;

said base having integral casket support means formed therein;

a bed molded of synthetic resin mounted on and bonded to the base and having a central portion supported above the base;

said central portion of the bed having recesses formed in the central portion of the bed and extending downward engaging the base for receiving a pillow and having a body supporting pad;

a removable top cover for enclosing a portion of the bed including the integral recesses;

said top cover having a bottom peripheral edge for resting against the bed;

said bed having a continuous peripheral ledge for receiving the peripheral edge of the top cover and for supporting the top cover; and

said bed having a raised rim located outwardly and upward of the ledge for forming an exposed peripheral cleft between the bed and top cover when the top cover is in place on the bed, said cleft being adapted to be filled with a sealing agent to bind the bed and top cover together and to hermetically seal the casket.

4,174,557

METHOD OF MOUNTING VALVE SEATS IN A BUTTERFLY VALVE

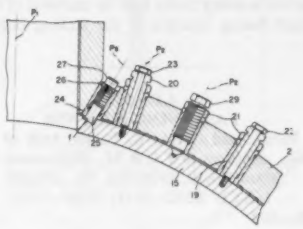
Yukio Goto, Osaka; Osamu Nakai, and Ikuo Yoshimori, both of Hirakata, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Mar. 31, 1978, Ser. No. 892,341

Claims priority, application Japan, Apr. 5, 1977, 52-43387[U]; Apr. 5, 1977, 52-43388[U]

Int. Cl.[2] B23P *15/00;* **F16K** *1/226*

U.S. Cl. 29—157.1 R **4 Claims**



1. A method of mounting a valve seat including a plurality of arcuate seat parts having end surfaces, in a butterfly valve having a disc-shaped valve closure member and stem portions which offstand therefrom and arranged to support seal means disposed in a valve body and arranged to contact said seat parts peripherally when the valve closure member is closed, said method comprising adjusting said seat parts relative to the positions of said end surfaces thereof by screwing a series of first bolts into said valve body, each of said first series of bolts having a tapered extremity substantially of conical shape and formed complemental to recesses in said seat parts, and a second series of bolts screwed into said valve body arranged to adjust said seat parts relative to the positions of said end surfaces, said method further including the steps of

(a) adjusting the first and second series of bolts to properly position said seat parts relative to said valve body,

(b) removing said first series of bolts from said valve body, and

(c) inserting a third series of bolts having a planar end into said valve body in place of said first to equalize pressure on said seat parts against said valve member.

4,174,558

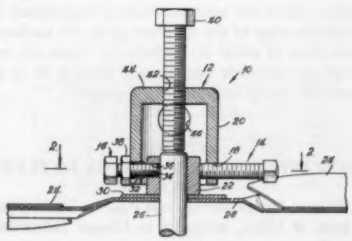
FAN OR WHEEL PULLING DEVICE

Irvin R. Dombrowski, 613 Linden Ave., Bellwood, Ill. 60104

Filed Jul. 31, 1978, Ser. No. 929,546

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—259 **6 Claims**



1. A device for pulling from a drive shaft an affixed hub having one or more radial threaded setscrew holes extending therethrough, the device being of the type having a hollow housing of sufficient internal capacity to accommodate the hub, with one or more locking bolts extending radially through

threaded holes in the wall of the housing and adapted to engage the hub, and a jacking bolt extending axially through a threaded hole in the top of the housing and positioned to engage the end of the shaft, an improvement comprising:

a. at least one circumferential slot in the wall of the housing located to register with a radial threaded setscrew hole in the hub, and

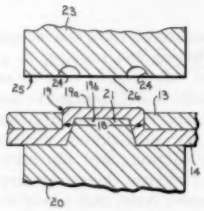
b. a threaded engagement screw having threads compatible with the threaded setscrew hole in the hub, said engagement screw passing through said slot and adapted to be screwed into the threaded setscrew hole to positively secure the housing to the hub for removal of the hub from the shaft during rotation of the jacking bolt against the shaft.

4,174,559

FASTENING METHOD

James E. Persik, and Gerald E. Persik, both of Menomonee Falls, Wis., assignors to J.J. & M., Milwaukee, Wis.

Filed Feb. 9, 1978, Ser. No. 876,295
Int. Cl.[2] B21D *39/00*; B23P *11/02*
U.S. Cl. 29—509 **2 Claims**



1. The method of securely fastening together two sheets of metal each having a thickness of at least about 0.025 inches which comprises:

(a) forming a hollow back, closed end cylindrical projection on one piece of metal;

(b) forming a projection-receiving aperture in the second piece of metal;

(c) positioning the first piece of metal on a support member having a head which extends into and fills the hollow back of the projection;

(d) positioning the second piece of metal upon the first with the projection received in and extending above the projection-receiving aperture; and

(e) then striking the head of the projection with a die having a ring-shaped groove having an outer diameter greater than that of the aperture and a circular flat central portion having a diameter less than the diameter of the aperture so that a portion of the metal of the head of the projection extending above the aperture forms a ring-shaped lip that overlaps the edge of the aperture, grips the surface of the second piece of metal and effectively limits the enlargement of the aperture and a tight friction fit is formed between the projection and the aperture.

4,174,560

TOOL FOR APPLYING CONNECTORS TO FLEXIBLE CABLE

Robert B. Senior, Grand Haven, and Paul A. Yarbrough, Muskegon, both of Mich., assignors to Cooper Industries, Inc., Houston, Tex.

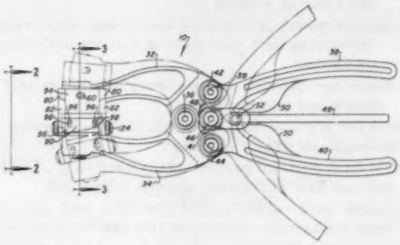
Filed Mar. 17, 1978, Ser. No. 887,906
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—566.1 **16 Claims**

1. A hand-held tool for applying a connector to flexible flat cable wherein said connector comprises a body having one or more terminals for making electrical contact with respective conductors in said cable, and a cover for holding said cable to said body, said tool comprising:

a pair of jaws being relatively movable one with respect to the other between open and closed positions;

a member disposed on one of said jaws for supporting said body;

a member disposed on the other of said jaws for engaging said cover to press said cover and said body together to



establish terminations between said terminals and said conductors in response to moving said jaws to a closed position;

means for moving said jaws between open and closed positions;

a cable cutting blade; and,

means for mounting said blade on one of said members for movement with respect to said one member between a position for cutting said cable and a non-cutting position.

4,174,561

METHOD OF FABRICATING HIGH INTENSITY SOLAR ENERGY CONVERTER

Robert E. House, Reading; Robert A. Irvin, and Daniel F. Kane, both of Sudbury, all of Mass., assignors to Semicon, Inc., Burlington, Mass.

Division of Ser. No. 656,343, Feb. 9, 1976, Pat. No. 4,082,570.
This application Oct. 27, 1977, Ser. No. 846,173
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—572 **20 Claims**

1. A method of fabricating a photovoltaic energy converter for converting incident radiant energy to electrical energy, said method comprising the steps of:

A. preparing a plurality of wafers of semiconductive material of a first conductivity type, each said wafer having

i. first and second opposed end faces,

ii. a first region below the first end face having a net impurity concentration of a second conductivity type,

iii. a second region below the second end face having a net impurity concentration of the first conductivity type greater than the concentration in

iv. a base region located between said first and second regions, and

v. a photovoltaic junction separating said first and base regions;

B. preparing a plurality of layers of an electrically conductive material;

C. stacking said wafers and conductive layers in a stack with said wafers and conductive layers in alternate layers, said wafers being oriented in the stack so that the first region in each said wafer is directed toward the same end of the stack;

D. fusing the stack to form an integrally bonded unit;

E. cutting from the fused stack a slab defining first and second opposed major surfaces transverse to the junctions of said wafers, the cut forming the second transverse surface of the slab being made along a plane that deviates from a normal to the junction in each said wafer by a predetermined small angle in a direction such that when said slab is viewed through the second transverse surface more of the base region and less of the first region in each said wafer is exposed thereby to provide increased space for junction depletion layer spreading at and below the second transverse surface; and

F. mounting the first transverse surface of said slab on a substrate, said slab being positioned on said substrate for exposure to the radiant energy along a direction essentially normal to the second transverse surface of said slab.

4,174,562

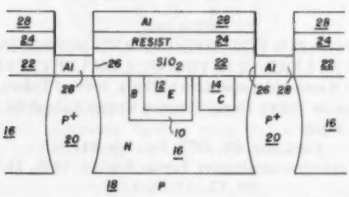
PROCESS FOR FORMING METALLIC GROUND GRID FOR INTEGRATED CIRCUITS

Thomas J. Sanders, Indialantic; William R. Morcom, Melbourne Beach, and Jacob A. Davis, Indialantic, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 689,441, May 24, 1976, abandoned, which is a division of Ser. No. 561,677, Mar. 25, 1975, Pat. No. 3,974,517, which is a continuation of Ser. No. 412,118, Nov. 2, 1973, abandoned. This application May 16, 1978, Ser. No. 906,380

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—578 **9 Claims**



1. A process for fabricating an integrated circuit having a plurality of planar regions of a first conductivity type separated by planar isolation barriers of an opposed second conductivity type and having semiconductor components formed in said planar regions comprising:

forming a first insulated layer on said planar regions with said planar isolation barriers exposed;

forming a first continuous conductor on said exposed isolation barriers having a thickness less than the thickness of said first insulated layer;

forming a second insulated layer on said first conductor having a thickness sufficient to produce a substantially planar surface with said first insulated layer;

forming select apertures in said first and second insulated layers to expose planar areas of said semiconductor components and areas of said first conductor respectively; and

forming a plurality of second conductors interconnecting said exposed planar areas and said exposed first conductor areas.

4,174,563

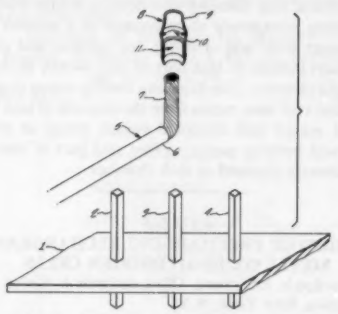
WIRE WRAP POST TERMINATOR FOR STRANDED WIRE

Damon G. Simpson, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 12, 1977, Ser. No. 859,273

Int. Cl.[2] H01R *5/04*

U.S. Cl. 29—628 **19 Claims**



1. A method of forming a wire wrap post termination which comprises:

a. removing the insulation from an end portion of a stranded wire;

b. threading said end portion of the stranded wire into a connector, said connnector comprising a solder insert and a fixturing member positioned in axially displaced relationship within a heat recoverable sleeve such that said fixturing member and said solder insert are held in place by said heat recoverable sleeve;

c. inserting a wire wrap post into said connector sleeve, such that the stranded wire is wedged between the post and the fixturing member of the connector; and

d. heating the assembly at a temperature sufficient to melt the solde. and occasion recovery of the heat recoverable sleeve without melting the fixturing member.

4,174,564

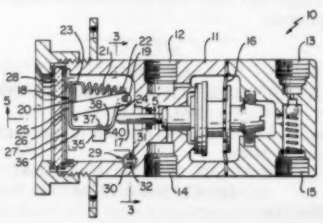
PNEUMATIC INDICATOR DEVICE AND METHOD OF MAKING THE SAME

William T. Moon, Jr.; Arden D. Rogers; Clifford E. Goff, and Harry B. Bannon, all of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 683,623, May 5, 1976, Pat. No. 4,107,492. This application Jun. 12, 1978, Ser. No. 914,200

Int. Cl.[2] H01H *35/40*

U.S. Cl. 29—622 **5 Claims**



1. In a method of making a pneumatic indicator device having a housing means carrying in a chamber thereof a movable flag that in one position visually indicates through a window means of said housing means one pneumatic condition of said device and in another position visually indicates through

said window means another pneumatic condition of said device, said housing means carrying therein a pneumatically operated plunger that engages and moves said flag between said positions thereof in relation to said pneumatic conditions of said device, the improvement comprising the steps of disposing an electrical switch means in said housing means, forming said movable flag with means thereon that operates said switch means so that said switch means electrically indicates said positions of said flag, forming said housing means with a bore means passing completely therethrough in a manner to partially intersect with said chamber and receive said electrical switch means therein so that part of said switch means is exposed to said chamber, and disposing sealing means in said bore means to seal said bore means from the exterior of said housing means and secure said electrical switch means in said bore means of said housing means so that said part of said switch means is directly exposed to said chamber.

4,174,565

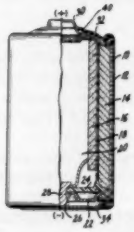
METHOD OF PRECHARGING RECHARGEABLE METAL OXIDE-HYDROGEN CELLS

Karl V. Kordesch, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 810,789, Jun. 28, 1977, abandoned. This application Mar. 28, 1978, Ser. No. 890,986

Int. Cl.[2] H01M *10/28*

U.S. Cl. 29—623.2 **5 Claims**



1. A method of manufacturing a sealed rechargeable cell with a precharge of hydrogen gas, said cell containing a metal oxide positive electrode, a hydrogen gas negative electrode separated from said positive electrode and an aqueous alkaline electrolyte, comprising the steps of: inserting a metallic member within said cell at a location adapted to contact said alkaline electrolyte, said metallic member being in the form of a solid body composed of a metal selected from the group consisting of aluminum, zinc and magnesium; and hermetically sealing said cell whereby a predetermined quantity of hydrogen gas is generated in-situ, within said cell, over a controlled period of time from a reaction by said member on contact with said electrolyte and with said reaction providing an inactive reaction product.

4,174,566

INSERTION TOOL FOR INTEGRATED CIRCUIT PACKAGES

John G. Smith, Erdenheim, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 30, 1978, Ser. No. 910,657

Int. Cl.[2] H05K *13/04*

U.S. Cl. 29—758 **9 Claims**

1. A tool for use in inserting within a connector an integrated circuit package having a metallic heat sink member and including a registration hole therein, said connector having a retention post for engaging said registration hole, said tool comprising:

a body member,

said body member having a plurality of contiguous concentric bores, one of said bores terminating in an extremity of said body member,

a pin member,

said pin member having a plurality of contiguous coaxial cylindrical sections, at least a first and second section being accommodated respectively within said bores, a third section contiguous with said second section and defining tip means for said pin member, said tip means for engaging said registration hole and having dimensions

such that the sides of said hole are gripped by the tip surface,

said pin member being slidably disposed within said body member and having said tip means and a portion of said second section adjacent thereto protruding from said extremity of said body member, and

spring means positioned in one of said bores and in contact with said pin member for applying a compressive force thereto which tends to drive said pin member in the direction of said extremity of said body member.

4,174,567

APPARATUS FOR STORING AND SUPPLYING PARALLEL LEAD ELECTRONIC CIRCUIT ELEMENTS

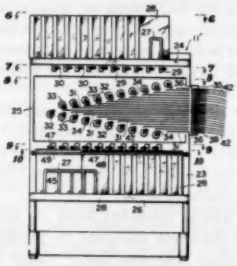
Masakazu Kamoshida, and Keiichi Ihara, both of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,919

Claims priority, application Japan, Sep. 16, 1976, 51-111013

Int. Cl.[2] H05K *3/30*

U.S. Cl. 29—741 **10 Claims**



1. An apparatus for storing and supplying parallel lead circuit elements disposed on an elongated web carrier in combination with a mechanism for processing and securing said circuit elements to a printed circuit board comprising in combination,

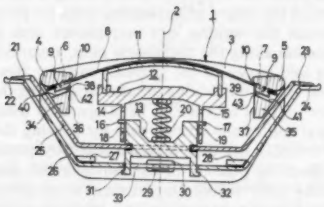
a plurality of cases, each of said cases supporting a reel therein, said reel being adapted to wind an elongated web carrier thereabout, support means for supporting said plurality of cases at predetermined positions, guiding and feeding means supporting by said support means, each of said guiding and feeding means being disposed proximate to one of said cases for incrementally advancing said web carried from said case, independently of the incremental advancement of each other web carrier advanced from each of said other cases, a plurality of guide plates disposed in parallel with respect to each other, each of said guide plates being disposed proximate to each of said guiding and feeding means in order to receive the web carrier incrementally advanced by said guiding and feeding means and guide same toward a mechanism particularly suited to process and secure the circuit elements to said printed circuit board and, a plurality of separator plates supported by said support means, each of said separator plates being disposed adjacent to a guide plate for receiving the web carrier guided thereby, a plurality of slide plates, each of said slide plates being disposed in abutment with said separator plate, and a plurality of second guide plates, each of said second guide plates being secured to said mechanism for processing and securing the circuit elements to a printed circuit board, to permit the second guide plate to be slideably displaced with respect to the slide plate when the ends of said second guide plate are at different elevations.

4,174,568

SHAVING HEAD FOR DRYSHAVING APPARATUS

Ingomar Mixner, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,713
Claims priority, application Austria, May 3, 1977, 3131/77
Int. Cl.[2] B26B *19/04, 19/20*
U.S. Cl. 30—34.1 **2 Claims**



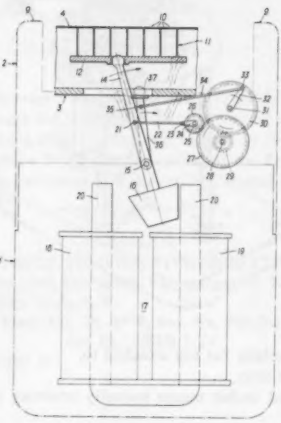
1. A shaving head for a dry shaver, which comprises a longitudinally extending flexible shear foil arcuated in the operating position, a longitudinally reciprocatable cutter cooperating with said flexible shear foil in such position, a longitudinally extending shaving-head frame having two longitudinal side members extending parallel to the longitudinal plane of symmetry of the shaving-head frame, each longitudinal side member having a contact surface for engagement with said flexible shear foil, at least one pin projecting from each contact surface, corresponding openings formed in said flexible shear foil for respectively receiving said pins, and a further member disposed in said shaving-head frame parallel to each longitudinal side member and opposite the free ends of the pins projecting from the contact surface thereof, said two further members each having a first surface extending parallel to the longitudinal plane of symmetry of the shaving-head frame, said two first surfaces facing each other and defining an aperture for insertion of the flexible shear foil into said shaving-head frame, said two further members also each having a second surface adjoining the respective first surface and forming an edge therewith, each second surface facing the contact surface of its associated longitudinal side member and being spaced from the free ends of the pins projecting from said contact surface, the opposite longitudinal sides of said flexible shear foil extending into the spaces between the respective second surfaces and the respective contact surfaces, the second surfaces being respectively disposed in two planes converging in accordance with the curvature of the flexible shear foil, and the plane extending through the edges of the two further members intersecting the projecting pins.

4,174,569

ELECTRIC RAZOR

Hans Schenk, Stadlgasse 6, Graz, Austria (A-8020); Maria Sprung, and Walter Sprung, both of Schiesstattgasse 5/6/23, Graz, Austria (A-8010)

Filed Feb. 24, 1978, Ser. No. 881,081
Claims priority, application Austria, Feb. 25, 1977, 1264/77
Int. Cl.[2] B26B *19/26*
U.S. Cl. 30—43.3 **12 Claims**



1. An electric razor comprising a housing including a shearing head attached thereto; a shearing comb disposed within the head and having openings permitting hair protruding from a surface to enter into an interior of the comb; a blade beam carrier mounting an elongated blade beam inside of and for cooperation with the comb for severing hair extending through the opening when the blade beam oscillates relative to the comb; drive means disposed within the housing for longitudinally oscillating the blade beam carrier relative to the comb, the drive means including electric motor means and a connecting member driven by the motor means and engaging the blade beam carrier; and shearing comb oscillating means operatively coupled with the connecting member for imparting to the shearing comb a first oscillating motion substantially parallel to the oscillating movement of the blade beam carrier, a second oscillating motion which is transverse to the first oscillating motion of the comb, and a third oscillating motion which lifts the shearing comb off said surface.

4,174,570

MAGNETIC PIN SETTER USEFUL IN DENTISTRY

Donald E. Schwartz, 778 Crestway Dr., San Antonio, Tex. 78239

Filed Jul. 14, 1977, Ser. No. 815,701
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—53 **6 Claims**

1. A magnetic pin setter useful in dentistry being magnetically adjustable in three dimensions comprising:

a. a metallic horizontal table supported above a base,

b. an adjustable work table positioned below said horizontal table,

c. a first magnet having its magnetically attaching surface magnetically slidably adjustable in a horizontal plane attached to said horizontal table,

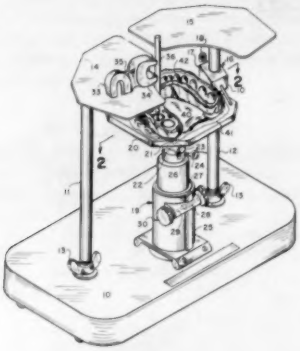
d. a second magnet spaced from said first magnet and having its magnetically attaching surface at right angles to the

said magnetically attaching surface of said first magnet secured in a fixed, stable relationship by,

e. a magnet connecting yoke retaining the said first magnet and said second magnet in predetermined spaced relationship,

f. a dowel support rod magnetically attached to said second magnet, said dowel support rod being slidably adjustable vertically and tiltably adjustable at any desired angle in a plane along said magnetically attaching surface of said second magnet,

g. a dowel pin frictionally attached to said dowel support rod,



h. a substantially flat top attached to,

i. a support stem,

j. a ball and socket means swivelly retaining said support stem,

k. an adjustable base secured to said ball and socket means for elevating and lowering said top further comprising:

(1) an elevator base,

(2) a ratchet shaft movably mounted in said elevator base, and

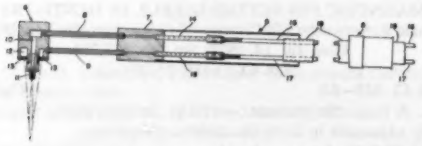
(3) a rack and pinion drive means for elevating and lowering said ratchet shaft.

4,174,571

METHOD FOR CLEANING TEETH

Ben J. Gallant, Portland, Tex., assignor to Dentron, Inc., Corpus Christi, Tex.

Filed Jul. 28, 1978, Ser. No. 928,907
Int. Cl.[2] A61C 3/06
U.S. Cl. 433—216 **6 Claims**



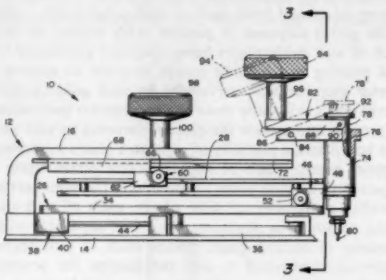
1. A method for cleaning teeth comprising concurrently directing separate streams of water and of an abrasive laden gas against a tooth to be cleaned, the abrasive comprising particles of a water soluble material, and the water and gas streams being directed in predetermined relation to each other and to areas of the tooth immediately adjacent to each other.

4,174,572

DRAFTING INSTRUMENT

Tom T. Mikulin, 601 Airport Blvd., South San Francisco, Calif. 94080

Filed Jun. 26, 1978, Ser. No. 918,801
Int. Cl.[2] B43L 11/04
U.S. Cl. 33—31 **2 Claims**



1. A drafting instrument for tracing a curve, including the combination of a movable base, a writing arm having a distal end for carrying a marking element, linkage means connected between the base and writing arm for guiding the marking element along a curvilinear path, said linkage means including a master arm carried at its proximal end by the base and connected at its distal end at a first point on the writing arm which is spaced a first predetermined distance from the marking element for guiding the first point for linear movement along a major axis, joint means carried by the base and connected with a second point on the writing arm which is spaced a second predetermined distance from the marking element for guiding the second point for linear movement along a minor axis orthogonal with the major axis whereby conjoint pivotal movement between the writing arm and master arm guides the writing element along the curvilinear path, a marking element for tracing said curve on the graphics surface, means carried by the distal end of the writing arm for supporting the marking element for vertical movement, hand-operated means carried by the distal end of the writing arm for moving the marking element vertically between a raised stand-by position and a lowered operating position in contact with the graphics surface whereby with the marking element in its operating position the hand-operated means can be manipulated for moving the writing arm along the curvilinear path, the hand-operated means including a yoke mounted on the distal end of the writing arm for pivotal movement about a horizontal axis, said yoke being coupled with the marking element for vertically moving the latter, means forming a handle on the yoke, said yoke being biased by gravity to pivot about the horizontal axis in a direction which moves the marking element toward its stand-by position, said yoke being moved in an opposite direction about the axis for permitting movement of the marking element toward the operating position when a force is applied to the handle for operating the instrument.

4,174,573

BLACK BOARD LINE MARKING DEVICE

George W. Comstock, Jr., P.O. Box 81, North Sioux City, S. Dak. 57049

Filed May 15, 1978, Ser. No. 905,877
Int. Cl.[2] B43L 13/00
U.S. Cl. 33—32 C **6 Claims**

1. A board line marking device comprising

a frame fitted with a plurality of wheels,

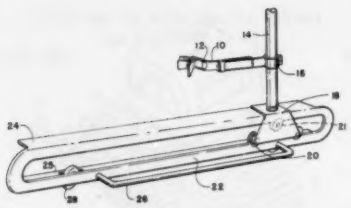
a trolley fitted with a plurality of wheels,

an arm mounted on said trolley,

clamp means of fastening a marker fitted to said arm,

said trolley mountable on said frame so that the wheels of the trolley rest on and are in rolling engagement with a

straight surface of the frame, with the wheels of said frame located so as to rest in rolling engagement on a horizontal chalk tray that extends from a vertical board, when a



marker is fastened in said clamp means and located so as to extend to the surface of said vertical board for the purpose of marking said board.

4,174,574

ENGINE OIL LEVEL MEASUREMENT DEVICE FOR SOUND PROOF ENCAPSULATED INTERNAL COMBUSTION ENGINES

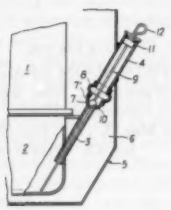
Karl Kirchweger, and Josef Roschmann, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Apr. 19, 1978, Ser. No. 897,842

Claims priority, application Austria, Apr. 28, 1977, 3043/77

Int. Cl.[2] G01F *23/04*

U.S. Cl. 33—126.7 R **5 Claims**



1. A device for the measurement of the engine oil level in sound proof encapsulated internal combustion engines by means of an oil dipstick, said device comprising an oil dipstick, and a dipstick guide tube comprising two coaxially and successively arranged guide tube parts, the inner of said two guide tube parts adapted to be secured to the engine and the outer guide tube part adapted to penetrate the encapsulation and be fixed thereto, said two guide tube parts being elastically and leakproof connected with each other by sealing means, and the inner guide tube part of the guide tube having a smaller diameter than the outer guide tube part, said inner guide tube part enlarging in diameter in the range of the connection of both guide tube parts to approximately the diameter of the outer guide tube part, said enlarged diameter of the inner guide tube forming a seat for a detent on the oil dipstick.

4,174,575

MEASURING INSTRUMENT

Kiyohiro Nakata, Kure, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,068

Claims priority, application Japan, May 31, 1977, 52-70413[U]

Int. Cl.[2] G01B *3/18, 5/00*

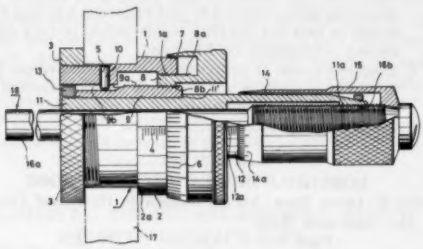
U.S. Cl. 33—164 R **8 Claims**

1. A measuring instrument comprising:

a first sleeve provided with a first thread and fixed to a frame;

a second sleeve axially displaceable along the axial direction of the first sleeve without rotation with respect to the first sleeve, said second sleeve having second and third threads;

a spindle with a second thimble, said spindle being screwed to the third thread and displaceable along its axial direction with respect to the second sleeve, and its stem extending through the first sleeve and the second sleeve; and



a first thimble displaceable with respect to the first sleeve and having a fourth thread screwed to the first thread and a fifth thread screwed to the second thread.

4,174,576

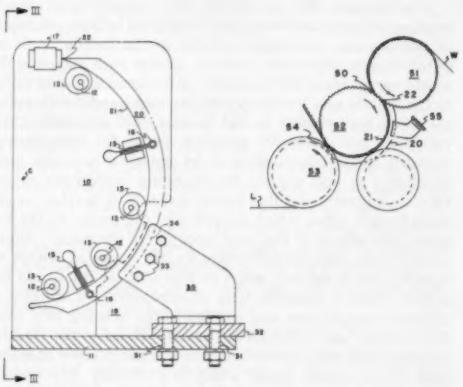
ADJUSTABLE PROFILE FINGER SETTING JIG

Michael L. Shepard, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Jun. 28, 1978, Ser. No. 919,762

Int. Cl.[2] G01B *5/14*

U.S. Cl. 33—181 R **3 Claims**



1. An assembly jig for corrugating machine finger-holder units comprising:

A. a side plate and a base plate integrally joined in mutually perpendicular planes;

B. a reference axis disposed perpendicularly to said side plate;

C. holder mounting means on said base plate to locate and secure a finger holder in substantially the same spacial position relative to said reference axis as said holder would occupy when mounted on a subject corrugating machine;

D. first adjustable surface means secured to said side plate at a radial distance from said reference axis approximately the same as a radius of a subject corrugating roll for locating one arcuate end of a stripper finger in substantially the same spacial position relative to said reference axis and

holder mounting means as said one arcuate end would occupy on said subject corrugating machine;

E. a plurality of second adjustable surface means secured to said side plate in an arcuate distribution relative to said reference axis for locating intermediate arcuate surface points on said stripper finger in substantially the same spacial positions relative to said reference axis and holder means as said intermediate points would occupy on said subject corrugating machine; and

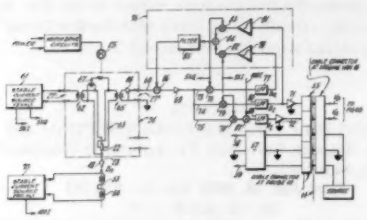
F. clamping means to temporarily secure said stripper finger to said side plate in simultaneous contact position with said adjustable surface means.

4,174,577

BOREHOLE DRIFT-DIRECTION PROBE

John R. Lewis, Stow, Mass., assignor to Harnessed Energies, Inc., Maynard, Mass.

Filed May 9, 1978, Ser. No. 904,273
Int. Cl.[2] G01C *9/00*
U.S. Cl. 33—302 **36 Claims**



1. A borehole drift-direction probe, comprising an elongate housing of length and diameter selected for reliable assumption of housing-axis orientation parallel to the locally applicable borehole-axis orientation, a rotary spindle with magnetic flux-sensor means mounted theretofor directional response normal to the spindle axis, means suspending said spindle with universal action with respect to said housing, said suspension means including gravitationally sensitive means for maintaining a constant vertical orientation of the spindle axis, motor means connected to said spindle for imparting continuous rotation thereto, whereby said flux-sensor means will develop an electrical output signal which is cyclically responsive to the horizontal component of the local direction of the earth's magnetic-field lines, electric-coil means fixedly mounted within said housing and positioned when excited to establish at said flux-sensor means a magnetic field of substantially uniformly distributed straight lines and parallel to the housing axis, means for exciting said electric-coil means, whereby the electrical output of said magnetic-sensor means is additionally characterized by an output signal which is cyclically responsive to instantaneous housing-axis inclination with respect to the vertical, and means for remotely transmitting said output signals.

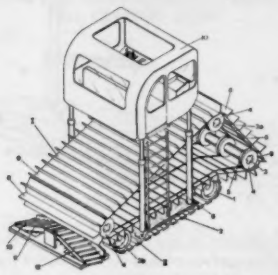
4,174,578

TRACKED SNOWPLOW

Bernardino Grillo, Via Beniamino, 13-, Laigueglia, Italy

Filed Mar. 15, 1978, Ser. No. 886,980
Claims priority, application Italy, May 24, 1977, 51201 B/77
Int. Cl.[2] E01H *5/00*
U.S. Cl. 37—43 R **10 Claims**

1. A tracked snowplough to work mainly against very high snow barriers, comprising tracked mover means; a frame fixed to the tracked mover means; a main digging and carrying belt assembly including a plurality of multi-link chains stretched in the form of triangles, a plurality of rotatable support rolls positioned at the apexes of the triangles, the rolls being positioned at the front and rear ends and the top of the tracked mover means, a plurality of digging shovels fixed, by brazing, onto the chains in a substantially perpendicular direction with respect to the chains and at predetermined distances therealong, the shovels engaging the tracked mover means; and two



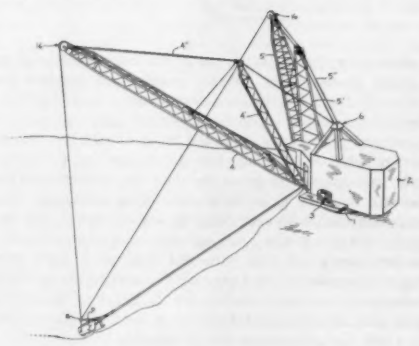
secondary carrying belts at the rear of the tracked mover means to receive snow from the shovels and to throw out the snow towards the right side and the left side of the snowplough.

4,174,579

TWIN BOOM DRAGLINE

Tom Learmont, Wauwatosa, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Mar. 3, 1978, Ser. No. 883,230
Int. Cl.[2] E02F *3/48*
U.S. Cl. 37—116 **4 Claims**

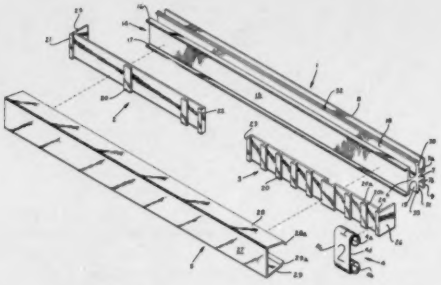


1. In a dragline having a machinery platform, a bucket, and a drag mechanism on the platform including a dragrope leading directly from the platform to the bucket, the combination comprising: two booms footed on the frame and disposed at a horizontal angle to one another, one of the booms being a digging boom and the other a dumping boom; and hoist mechanisms for the booms, each hoist mechanism including a hoist rope leading over the top of the respective boom to the bucket, the drag mechanism being operable to move the bucket from a start position under the digging boom to a filled position under the digging boom and closer to the platform, the hoist mechanisms being operable at relatively different speeds to move the bucket from filled position to a dump position under the dumping boom and back to start position.

4,174,580
ADJUSTABLE INDICATING DEVICE

Carlos L. Sanders, Atlanta, and James L. Gebhardt, Roswell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 24, 1978, Ser. No. 899,463
Int. Cl.[2] G09F *11/21*
U.S. Cl. 40—518 **15 Claims**



1. An adjustable indicating device arranged for mounting on a shelf edge moulding strip having a pair of vertically spaced horizontal holding strips, said device comprising an elongated base element formed of semirigid yieldable material and having an extruded elongated medial strut coextensive with said base element and bifurcated along one edge to form yieldable supports for a pair of integral mounting strips adapted for removable mounting between said holding strips and respectively engageable therewith so as to support said elongated base element, a support channel having a central web section integrally formed along an edge of said medial strut remote from said mounting strips and defining a pair of storage cavities on opposite sides of said medial strut, at least one self coiling tape having its coiled ends disposed respectively in said cavities and having its intermediate section disposed outwardly of said support channel and being movable vertically relative thereto, and visually observable indicia formed along the length of said tape.

4,174,581
GUNSIGHT MOUNT FOR WINCHESTER RIFLE

Joseph C. Castellano, 128 Shrewsbury Ave., Red Bank, N.J. 07701

Filed Dec. 29, 1977, Ser. No. 865,371
Int. Cl.[2] F41G *1/38*
U.S. Cl. 42—1 ST **2 Claims**

1. A telescopic gun sight mounting device adaptable for attachment of a telescopic sight to a "Winchester" 1894 model rifle, wherein said rifle is formed with a gun barrel, to which a fixed sight is mounted over the said gun barrel and wherein said rifle is formed with a gun receiver in which spaced screw holes are located in a side portion of said gun receiver, and where said rifle is equipped with a cartridge ejection port that opens to the top of said rifle, said device comprising

an elongated mounting bracket formed of a first portion that extends along a vertical plane when a second portion of the bracket extends along a horizontal plane, said second portion extending from a side of the upper front section of the said first portion, with said first portion formed in its lower rear section with a plurality of holes located so as to align with the spaced screw holes in the gun receiver,

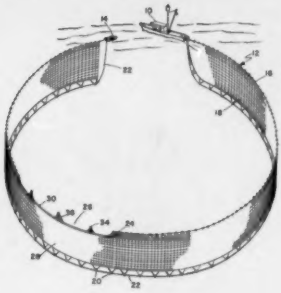
said second portion being substantially flat and formed with spaced openings for screws for securing a telescopic sight above said second portion, in which

said bracket is of a size and shape so that with said first portion fastened by screws through the said holes in the said first portion to the gun receiver of a said "Winchester" 1894 model rifle, the said second portion extends above the barrel of the rifle forward of the cartridge ejection port and such that a telescopic sight mounted by screws through the spaced openings of the said second portion extends forward of the said ejection port.

4,174,582
COMMERCIAL FISHING NET ASSEMBLY WITH A PORPOISE ESCAPE ZONE

John R. McKnight, 5087 Park West Ave., San Diego, Calif. 92114

Filed Feb. 9, 1978, Ser. No. 876,538
Int. Cl.[2] A01K *73/12*
U.S. Cl. 43—14 **4 Claims**



1. A fish net assembly comprising:

(a) an elongated reticulated net member balanced to be vertically depoyed in the water;

(b) at least a portion of said net member defining a drop net which defines a porpoise escape zone, and including an inflatable hose secured to the upper edge thereof and remote control means for selectively inflating and deflating said hose to selectively raise and lower said drop net in the water between a position on the water surface and a submerged position at a controlled, pre-selected depth beneath the surface; and

(c) a plurality of floats longitudinally spaced along said hose and connected and spaced vertically from said hose by individual tethers of substantially uniform length, said buoys being discreet and free-standing aside from said tether connections to thus define a plurality of completely free spaces at the water surface bordered along the sides by consecutive buoy pairs and their respective tethers, and along the bottom by said hose.

4,174,583
LINE GUIDE ASSEMBLY FOR FISHING RODS

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan

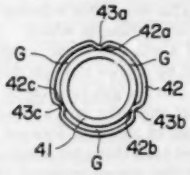
Filed Oct. 5, 1977, Ser. No. 839,415
Int. Cl.[2] A01K *87/04*
U.S. Cl. 43—24 **6 Claims**

1. An improved line guide assembly for fishing rods comprising:

a fixing ring of elastic material having an outer periphery and an inner periphery;

a guide ring within said fixing ring, said guide ring having an

outer periphery of smaller diameter than said inner periphery of said fixing ring; and



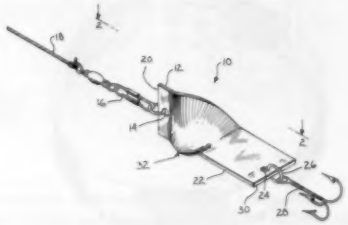
circumferentially spaced elements between said outer periphery of said guide rings and said inner periphery of said fixing ring, said elements applying radial pressure between the rings to hold the rings in an assembled condition.

4,174,584

FISHING LURE

Charles R. Howard, 404 Newcomb St., Whitewater, Wis. 53190

Filed Dec. 8, 1977, Ser. No. 858,624
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.5 **3 Claims**



1. A fish lure formed of an elongated rectangular strip of material of uniform width having a central axis of elongation, said lure having planar leading and trailing end portions generally aligned along the axis of elongation of said rectangular strip, the plane in which said leading end portion lies being perpendicular to the plane in which said trailing end portion lies, the central portion of said lure comprising a section twisted to perpendicularly orient said leading and trailing end portion planes, said twisted section exhibiting a high degree of rotation per unit of axial length and occupying the same axial length in the lure as said trailing end portion, said twisted section providing a combined spinning and zig-zag motion to said lure, said leading end portion being one-quarter the length of said trailing end portion, said trailing end portion providing a stabilizing rudder to said lure and having means for connecting a fish hook to the lure, said leading end portion having means for connecting the lure to a fishing line.

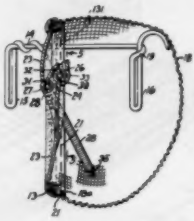
4,174,585

LIVE BAIT CARRIER FOR FISHERMEN AND THE LIKE

Lawrence Beesley, 1095 E. Oakland Ave., Hemet, Calif. 92343

Filed Dec. 27, 1977, Ser. No. 864,524
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—55 **3 Claims**

1. A live bait carrier comprising
a container having an opening therein,
the part of said container surrounding said opening being substantially rigid,
a cover of resiliently stretchable fabric,
means attaching said cover to said container over said opening,
said cover having an access opening therein,
spring means yieldably causing said fabric to close said access opening whereby to prevent escape of live bait from said container,
said spring means comprising first and second springs attached to respective portions of said fabric on opposite sides of said opening,
first means for tensioning said first spring endwise,



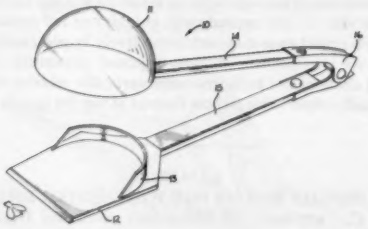
this tensioning means also tensioning the ends of said first spring in a first direction away from said second spring,
second means for tensioning said second spring endwise,
said second means also tensioning the ends of said second spring in a direction opposite to said first direction to cause said portions to overlap each other and to yieldably close said opening.

4,174,586

BUG CATCHER

Louis Burzdak, 2619 Sepulveda Blvd., Apt. No. 8, Los Angeles, Calif. 90064

Filed Jun. 14, 1978, Ser. No. 915,317
Int. Cl.[2] A01M *3/00*
U.S. Cl. 43—134 **3 Claims**

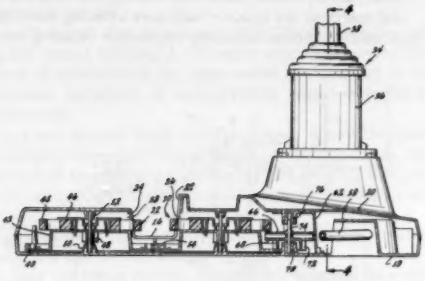


1. An improved bug catcher which captures an insect without killing it in order to that a person may set it free outdoors, said improved bug catcher comprising:
a. a flat platform member which has an angularly cut end surface which enables the person to scoop up the insect;
b. a hollow semispherical member which has an open bottom and which is adapted to be enclosed by said platform member;
c. a first elongated member which is mechanically coupled to said platform member at one end thereof;
d. a second elongated member which is mechanically coupled to said semispherical member at one end thereof;
e. a shielding member comprising an upwardly disposed wall adjacent to the end opposite the angularly cut end of said platform member thereon in order to provide a stop for the insect so that the person's quick scooping action will not cause him to allow the insect to avoid being entrapped between said platform member and said semispherical member; and
f. coupling means for pivotally coupling the ends of said first and second elongated members oppositely disposed from the ends thereof to which said semispherical member and said platform members are mechanically coupled.

4,174,587
AIR TURBINE OPERATED VEHICLE ACCELERATOR TOY

Marius J. Morin, Rancho Palos Verdes; Otto L. Gabler, Lawndale, and Eugene J. Kilroy, Palos Verdes Estates, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 12, 1977, Ser. No. 832,418
Int. Cl.[2] A63H *29/16*
U.S. Cl. 46—1 K **8 Claims**



1. A toy for accelerating unpowered toy vehicles along a roadway comprising:

a housing having a roadway portion thereon;

a pair of vehicle engaging rollers rotatably mounted opposite each other on opposite sides of said roadway portion;

an air pump coupled to said housing;

turbine means rotatably mounted within said housing, said turbine means including a turbine housing and a turbine, said turbine housing including air inlet means for directing air into said turbine, said turbine housing having means for providing an audible sound as the toy is operated, said sound providing means including an aperture in said turbine housing adjacent said air inlet means whereby air passing through said inlet means is deflected over an edge of said aperture to cause said sound;

means coupling said turbine to said rollers for rotation of said rollers in opposite directions in response to rotation of said turbine; and

conduit means coupled to said air pump for directing air from said pump into said turbine means to rotate said turbine whereby to accelerate vehicles in said roadway portion in a predetermined direction.

4,174,588
TOY BLOOD PRESSURE MONITORING DEVICE

W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 6, 1978, Ser. No. 875,187
Int. Cl.[2] A63H *29/16*
U.S. Cl. 46—44 **5 Claims**

1. A toy blood pressure monitoring device comprising:

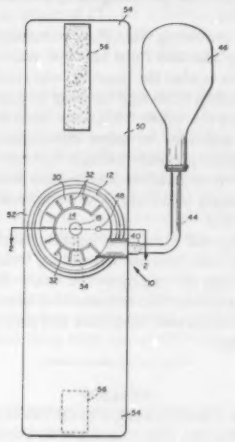
a housing having an open side and a pressure indicating scale on the opposite side;

a flexible diaphragm covering said open side;

a fan mounted for rotation in said housing;

a pointer coupled to said fan and coacting with said scale; and

air impelling means coupled to said housing for substantially simultaneously directing repetitive pulses of air against said fan whereby intermittent rotation is imparted to said fan for repetitively moving said pointer over said pressure indicating scale, and against said diaphragm whereby said

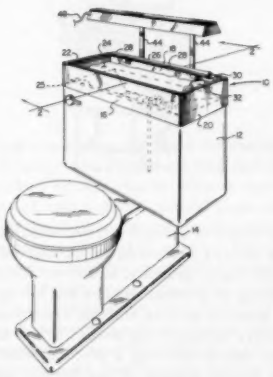


diaphragm is repetitively deflected to simulate a heart pulse beat.

4,174,589
BATHROOM PLANTER BOX

Lonnie J. Daharsh, 6227 Shadybrook La., Dallas, Tex. 75206

Filed Oct. 28, 1977, Ser. No. 846,437
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **3 Claims**



1. A bathroom planter box for receiving soil and housing plants and vegetation within a bathroom upon an open top flush tank of a conventional commode and being in fluid-flow communication therewith for facilitating the watering of said plants and providing for drainage into said flush tank, said planter box comprising:

an elongated housing received within and upstanding from the open top of said flush tank and including four generally upstanding side walls each of said side walls having a lower peripheral portion matingly engaging the top region of said flush tank in secured engagement thereon;

a base portion forming the bottom surface of said housing, said base portion comprised of at least two surfaces slanted one toward the other with a drainage aperture provided therebetween for facilitating the flow of water witin said housing and the drainage therefrom directly into said flush tank;

filter means disposed within said drainage aperture for restricting the transfer of particles of soil therethrough and into said flush tank and comprising a screen affixed across said aperture;

apparatus for providing fluid flow communication between said housing and said flush tank for watering the vegetation cared for within the housing, said apparatus including a tube extending from said housing in depending communication with the water within the flush tank therebelow;

pump means provided in inline communication with said tube for pumping water through said tube and dispersing same upon the vegetation disposed within said planter box and maintaining said fluid flow communication with said flush tank; and

means securing said elongated housing atop said flush tank including at least two lips depending from said side walls of said housing for engaging the inside side walls of said flush tank whereby secured positioning and fluid communication between said flush tank and said elongated housing is affected.

4,174,590

LOWER FRAME FOR PIVOTED WINDOW

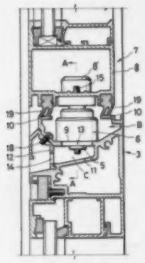
Eiryo Oogami, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Dec. 20, 1977, Ser. No. 862,647

Claims priority, application Japan, Dec. 21, 1976, 51-171315[U]

Int. Cl.[2] E06B *1/04*

U.S. Cl. 49—504 **4 Claims**



1. A lower frame of a window frame structure for rotatably supporting a pivoted window in an opening defined by frames of the window frame structure, said lower frame having a top face confronting the pivoted window and having a first groove portion of a grooved section, and said lower frame comprising a second groove opened to the outside below said first groove portion, first means securing a pivoted window-supporting shaft in the central portion of the bottom side of said first groove portion confronting the pivoted window, said second groove being adapted by its opening to the outside to the dismounting of said pivoted window-supporting shaft at the bottom side of the first grooved portion and ventilation holes formed in said first groove portion so that said ventilation holes are communicated with said second groove opened to the outside.

4,174,591

APPARATUS FOR CLEANING SAND CORES

George T. Dupre, Palatine, and Thomas M. DeMarco, Chicago, both of Ill., assignors to NFE International Ltd., Palatine, Ill.

Filed Apr. 20, 1978, Ser. No. 898,203

Int. Cl.[2] B24B *31/00*

U.S. Cl. 51—16 **13 Claims**

1. Apparatus for removing fins from foundry sand cores comprising:

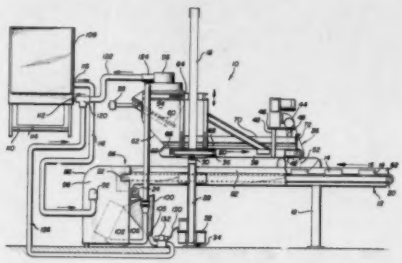
conveyor means, including a moving core conveyor for transporting said sand cores;

cleaning means mounted above said conveyor means, including a core cleaning material reservoir, for delivering a falling curtain of said cores cleaning material onto said sand cores for removing said fins;

separator means for separating said cleaning material from loosened sand resulting from removal of said fins;

loading means for receiving said separated cleaning material from said separator means and loading said cleaning material reservoir for reuse of said core cleaning material;

said loading means including respective cleaning material



and sand receptacles for receiving said respective separated particles from said separator means, a vacuum source coupled to said cleaning material reservoir and a conduit interconnecting said cleaning material reservoir and said cleaning material receptacle to convey cleaning material in said receptacle to said reservoir; and

said cleaning means including a cleaning material conveyor mounted intermediate said cleaning material reservoir and said core conveyor, and means for periodically interrupting the transfer of said cleaning material from said receptacle to said cleaning material reservoir to deposit the periodically accumulated cleaning material in said reservoir onto said cleaning material conveyor.

4,174,592

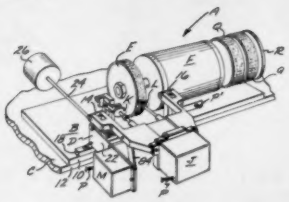
LAPIDARY DEVICE

Paul E. Bernhardt, 1728 E. 3rd St., Long Beach, Calif. 90802

Filed Sep. 1, 1978, Ser. No. 939,071

Int. Cl.[2] B24B *5/16*

U.S. Cl. 51—101 R **5 Claims**



1. A lapidary device for use in automatically transforming a generally elliptical shaped piece of rock that serves as a blank into a cabachon of smaller transverse area that conforms to the periphery and convex surface configuration of a rigid pattern, which device includes:

a. a flat base that has a first longitudinal edge and an upper surface;

b. a frame assembly that includes first and second longitudinally spaced members transversely disposed on said base adjacent said first edge above said upper surface thereof and pivotally supported on said base;

c. a grinding wheel disposed above said upper surface inter-

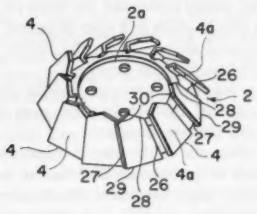
mediate said first and second members, said grinding wheel having a flat peripheral outer abrasive surface;
d. first power operated means for rotating said grinding wheel;
e. first means that tend to pivot said frame assembly towards said grinding wheel with a first force;
f. a yoke pivotally supported from said frame assembly, said yoke including a pair of spaced legs that project away from said grinding wheel and a web that extends between the portions of said pair of legs most remote from said grinding wheel;
g. guide means that extend upwardly from said base, said guide means defining a vertically extending curved surface of substantially the same radius of curvature as the abrasive periphery of said grinding wheel and aligned therewith;
h. first and second longitudinally spaced, transverse shafts rotatably supported from said web between said legs, said first shaft transversely aligned with said guide surface, and said second shaft transversely aligned with said grinding wheel;
i. second power operated means for concurrently rotating said first and second shafts;
j. a rigid cabachon pattern transversely mounted in a centered position on the end of said first shaft most adjacent said guide surface;
k. second means for removably supporting said rock blank in a substantially centered position on the end of said second shaft closest said abrasive periphery of said grinding wheel; and
l. third power operated means that concurrently reciprocate said yoke, first and second shafts, pattern and rock blank upwardly and downwardly relative to said frame assembly concurrently with the rotation of said first and second shaft, and said frame also reciprocating upwardly and downwardly relative to said base during the grinding operation due to the rotation of said rock blank relative to said grinding wheel with which it is in pressure contact, said reciprocation of said frame relative to said base continuing until said rock blank has been formed into said cabachon, and the grinding of the convex surface on said rock blank being controlled by the convex surface of said pattern that is in rotatable sliding contact with said guide surface.

4,174,593

ABRASIVE BLASTING MACHINE

Riichi Maeda, 30-1, Kitakata 2-chome, Ichikawa-shi, Chiba, (272), Japan

Continuation-in-part of Ser. No. 677,785, Apr. 16, 1976, Pat. No. 4,064,661. This application Nov. 28, 1977, Ser. No. 855,466
Claims priority, application Japan, Dec. 10, 1976, 51-147650
Int. Cl.[2] B24C *5/06*
U.S. Cl. 51—435 **13 Claims**



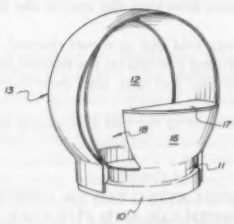
1. An abrasive blasting apparatus comprising:
an abrasive particles supply means and a rotatable impeller for blasting onto a workpiece the abrasive particles supplied from said abrasive particles supply means,
said impeller having around its rotation axis a plurality of vanes provided at spaced relationship relative to each other,
each of said vanes having a surface containing a first axis inclined at an angle of 25°–65° relative to the rotation axis and containing a second axis inclined at an angle of 40°–80° relative to an axis crossing the rotation axis at right angle,
said vane having a first end edge and a first side edge which are positioned closer to the rotation axis, and also having a second end edge and a second side edge which face said first end edge and first side edge, respectively, and further having a third edge located between said first end edge and said first side edge and crossing these two edges,
the projection of the intersection of said first end edge and said second side edge onto said rotation axis being positioned between the same projection of the intersection of said first end edge and said third edge and the intersection of said first side edge and said third edge,
whereby said abrasive supply means supplies abrasive particles from said third edge onto said surface.

4,174,594

CLOSABLE SALES KIOSK

Michel A. Panzini, Senneville, Canada, assignor to Multi Restaurants Inc., Montreal, Canada

Filed Apr. 20, 1978, Ser. No. 898,461
Int. Cl.[2] E04B *1/346*
U.S. Cl. 52—65 **6 Claims**



1. A sales kiosk comprising (a) a fixed substantially spherical shell member mounted on a cylindrical base, said shell member being truncated by a vertical chordal plane in the region of the center line thereof, said vertical chordal plane extending between the top of the shell and a horizontal serving counter in an intermediate region of the shell, said serving counter being annular and extending between the vertical truncated edges of the shell, and said serving counter including an entryway gap adjacent one of said vertical truncated edges and (b) an outer shell including a spherical segment portion merging into a chordal skirt portion mounted for rotation on and surrounding said fixed shell, with said chordal skirt portion adjacent said cylindrical base, said outer shell being truncated by a vertical chordal plane located forward of the center line thereof and being arranged to rotate relative to the fixed shelf such that in the normal open position the serving counter is exposed and the entry gap is covered by the outer shell, in the normal closed position the serving counter and entry gap are entirely covered by the outer shell and in the entry position the entry gap is uncovered.

4,174,595

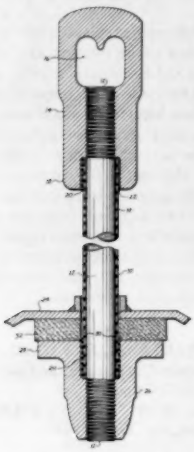
ANCHOR EYE PROTECTOR

Gary Q. Watson, Box F, Del Rio, Tex. 78840

Filed Feb. 24, 1978, Ser. No. 880,785
Int. Cl.[2] E02D *5/74*
U.S. Cl. 52—166 **6 Claims**

1. In an earth anchor having
a. an anchor member embedded in the earth,

b. a rod extending from the anchor member to above the earth,
c. an eye on the end of the rod for attaching a tension member to the rod, and
d. protective covering on the rod to impede corrosion of the rod;



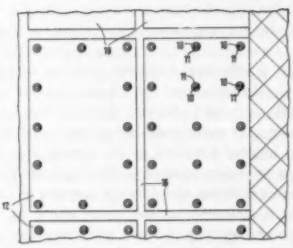
the improved structure attaching the eye to the rod comprising:
e. an eye cap having said eye as a part thereof,
f. an eye flange forming a recess on the bottom of the eye cap telescoped over the rod and also over said protective covering,
g. said eye cap secured to the rod above said eye flange.

4,174,596

DETACHABLE INSULATING COVER ASSEMBLY FOR GREENHOUSES AND THE LIKE

Manfred Deibele, Eislingen, Fed. Rep. of Germany, assignor to Deibele GmbH & Co., Uhingen, Fed. Rep. of Germany

Filed Sep. 22, 1977, Ser. No. 835,540
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642543; Mar. 23, 1977, 2712676
Int. Cl.[2] E06B *9/00*
U.S. Cl. 52—202 **15 Claims**



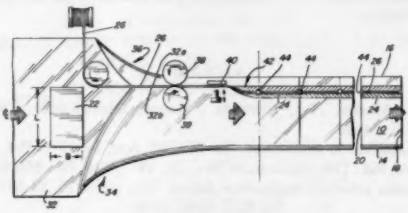
1. An easily attachable and detachable insulating cover assembly, particularly suited for application to the wall elements of the side walls and ceiling of a greenhouse, or of a comparable enclosed building structure, where convective heat transfer across said wall elements is to be minimized, the insulating cover assembly comprising in combination:
a cover sheet of resiliently flexible air-impermeable plastic material;
means for mounting said cover sheet of plastic material in relation to a matching wall element of said greenhouse, in a coextensive, transversely spaced relationship, so as to enclose an air space of substantial width therebetween; and
means for sealing off the borderlines of said air space, so as to entrap within said air space a stationary air layer which serves as a barrier to convective heat transfer; and wherein
said cover sheet mounting means includes a series of fastener assemblies spaced along a clamping line near an edge of the cover sheet, each fastener assembly comprising a pointed stem as part of a fastener base which is permanently attachable to the wall element of the greenhouse, and a fastener cap which is insertable over and securable to said stem, following impalement thereover of the cover sheet, thereby clamping the latter against the fastener base; and
said air space sealing means is defined by the edge portion of the cover sheet which is located outside the clamping line, the edge portion forming a fold toward the wall element of the greenhouse, thereby stiffening the cover sheet along the fold and making elastic contact with the wall element, due to the resiliency of the cover sheet in said fold.

4,174,597

PROCESS FOR WRAPPING ARTICLES AND PROVIDING RECLOSABLE CONTAINER

John C. Mowli, 2032 W. jarvis, Chicago, Ill. 60645, and Harry Bala, 2259 N. Kedzie, Chicago, Ill. 60647

Filed Apr. 7, 1978, Ser. No. 894,497
Int. Cl.[2] B65B *61/00, 43/10*
U.S. Cl. 53—410 **13 Claims**

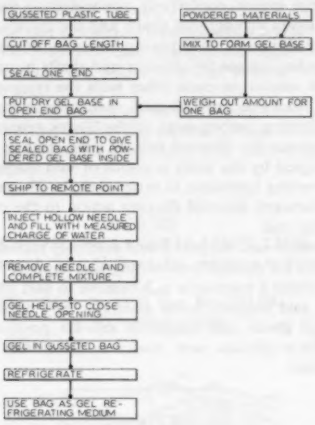


1. A process for wrapping articles and providing a reclosable plastic container which comprises the steps of:
conveying a plastic sheet in a feed direction;
aligning a closure member with the plastic sheet substantially parallel to the feed direction;
feeding the article to be wrapped into the plastic sheet;
folding one side of the plastic sheet over the article and alongside the closure member;
folding the other side of the plastic sheet alongside the closure member in the opposite direction so that the portions of the plastic sheet alongside the closure member face each other;
heat sealing the portions of the plastic sheet facing each other on opposite sides of the closure member so as to enclose the closure member within sealed portions of the plastic sheet; and
heat sealing and cutting the overfolded plastic sheet transversely.

4,174,598
METHOD FOR MAKING A PACKAGED GEL REFRIGERANT

Patrick J. Shepherd, P.O. Box 328, Lodi, Calif. 95240, and David L. Hubble, Sr., Lodi, Calif., assignors to Patrick Joseph Shepherd, Lodi, Calif.

Filed May 24, 1978, Ser. No. 908,977
Int. Cl.[2] B65B *3/12, 3/02;* **F25D** *3/08*
U.S. Cl. 53—431 **7 Claims**


GUSSETED PLASTIC TUBE
CUT OFF BAG LENGTH
SEAL ONE END
PUT DRY GEL BASE IN OPEN END BAG
SEAL OPEN END TO GIVE SEALED BAG WITH POWDERED GEL BASE INSIDE
SHIP TO REMOTE POINT
INJECT HOLLOW NEEDLE AND FILL WITH MEASURED CHARGE OF WATER
REMOVE NEEDLE AND COMPLETE MIXTURE
GEL HELPS TO CLOSE NEEDLE OPENING
GEL IN GUSSETED BAG
REFRIGERATE
USE BAG AS GEL REFRIGERATING MEDIUM
POWDERED MATERIALS
MIX TO FORM GEL BASE
WEIGH OUT AMOUNT FOR ONE BAG

1. A method for making packaged gel refrigerant, including in combination the following sequential steps:

(a) cutting off predetermined lengths of polyethylene gusseted tubing having a gusset fold along each side edge, so that there are two open ends of each cut-off length,

(b) heat-sealing one end of each cut-off length, by melting and congealing together four thicknesses at each of the two gusseted portions at that end and melting and congealing together two thicknesses in between the gusseted portions, thereby forming an open-end bag,

(c) inserting into the open-end bag a metered amount of gel base comprising a dry solid mixture of finely powdered materials, said metered amount being only about one-fifth to one-tenth of the weight of the ultimate gel refrigerant,

(d) heat-sealing the open end of said open-end bag, as in step (b), to provide a closed and sealed bag containing the dry finely-powdered gel base,

(e) shipping the bags from step (d) to a remote location, so that the shipping weight is only about one-fifth to one-tenth that of the ultimate gel refrigerant,

(f) at said remote location, forcing a hollow needle having a sharp inclined cutting end through a said bag adjacent one sealed end, the bag being held so that its contents lie below the needle-entry location, said needle being forced through the gusset fold at a locus next to said one sealed end so that it cuts through the bag but leaves a small plastic flap still attached to the bag, said needle temporarily forcing said flap to one side of the resultant opening,

(g) sending through said needle and said opening and downwardly into said bag, a jet of a metered amount of water under high pressure, said metered amount having a weight approximately four to nine times the weight of said gel base in said bag,

(h) removing the needle from the bag so that the cut flap is caused by the gusset-fold to close most of said opening,

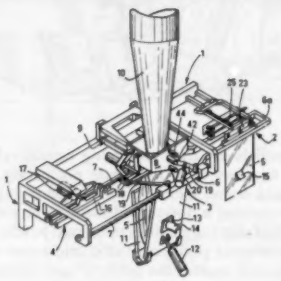
(i) mixing the water and powder together while keeping them away from said opening, so that contact is assured between all of said gel base and said water, and a flexible gel begins to form, and

(j) distributing the freshly formed and still forming flexible gel substantially evenly throughout said bag, said gel holding the water and holding itself together to prevent leakage or seepage out through the flap-blocked opening formed by the needle, so that the bag can be used thereafter in any position and can withstand substantial pressure thereon as in being molded to a shape, without leakage of gel or water from said bag.

4,174,599
BAGGING MACHINE FOR PACKAGING POWDERED MATERIALS

Robert Callet, and Henri Jeantet, both of Chaumont, France, assignors to Societe Anonyme des Imprimerie et Papeterie de l'Est, Chaumont, France

Filed Aug. 15, 1978, Ser. No. 933,965
Claims priority, application France, Aug. 18, 1977, 77 25335
Int. Cl.[2] B65B *31/04, 1/22, 43/30*
U.S. Cl. 53—512 **10 Claims**



1. Bagging machine for packaging powdery materials into bags of the "open mouth" type, said machine comprising a bag-gripping and opening station of the sucker type adapted to be connected to a source of vacuum, a bag-filling station comprising an inlet chute for the substance connected to a measuring and/or weighing means, means for opening and closing the orifice of the chute, means for inserting this orifice into the open mouth of the bag and to apply the lips of the latter into sealed contact against said chute, means for compacting the substance being filled into the bags and means for sucking out the air contained inside the bags being filled, a station for closing the bags by welding and/or sewing, means for holding the bags by suspension and for successively transferring them from one station to the next and means for automatically synchronizing and sequencing the various movements and operations at the various stations.

4,174,600
ROLL OPENING DEVICE WITH HEADER STABILIZER

George B. Cicci, Burr Ridge, and John D. Segredo, Chicago, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jun. 12, 1978, Ser. No. 914,319
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—1 **4 Claims**

1. A hay harvesting machine comprising:

a wheel supported main frame;

a laterally elongated crop harvesting header mounted to said frame by pivotal linkage including an upper link and a pair of lateraly spaced lower swing links permitting movement of the header between a lower operating position and a raised transport position;

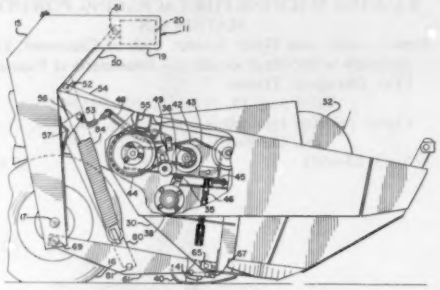
hay cutting apparatus mounted on said header and disposed transversely thereacross adjacent the forward edge of said header;

upper and lower transversely extending hay conditioning rolls rotatably mounted to said header rearwardly of said cutting apparatus, said lower conditioning roll being mounted on a fixed axis and said upper roll being mounted at each end to lever arms pivotally mounted to said header

for relative swinging movement of the upper roll toward and away from said lower roll;

spring tensioning means connected to said lever arms and biasing said upper roll to an operating position closely adjacent the lower roll;

toggle links pivotally mounted to said header adjacent each



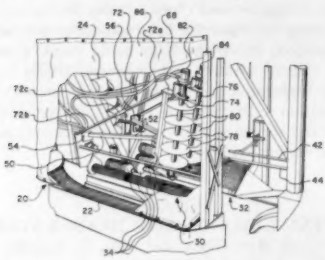
of said roll lever arms and being operatively connected thereto and having a free ends projecting toward said frame, said frame including means engaging said toggle links for causing a downward force to be exerted on said free ends of said toggle links upon said header being raised to said transport position so that said upper conditioning roll is opened against the force of said tensioning spring.

4,174,601

METHOD AND APPARATUS FOR HARVESTING TOBACCO

J. Curtis Griffin, Branford, Fla., assignor to Harrington Manufacturing Co., Lewiston, N.C.

Filed Apr. 20, 1977, Ser. No. 789,209
Int. Cl.[2] A01D *45/16*
U.S. Cl. 56—27.5 **4 Claims**



1. In a tobacco harvester having a mobile main frame and conveying means associated with said harvester for conveying tobacco material along said harvester during the harvesting operation, the improvement comprising a harvesting assembly including:

(a) a support frame assembly;

(b) at least twc laterally spaced shafts rotatively journaled within said support frame assembly;

(c) a plurality of circular saw blades secured on each of said shaft and rotatable therewith, said circular saw blades being axially spaced on each respective shaft such that the circular saw blades of one shaft cooperate with the circular saw blades on the other shaft to cut portions of entering tobacco stalks into stalk segments and, wherein the circular saw blades secured on the two respective shafts are disposed in staggered relationship such that each circular saw blade is disposed in a separate and distinct plane relative to any one of the adjacent circular saw blades on the adjacent shaft so as to define a generally vertical stalk cutting area that lies generally midway between the outer extremities of the circular saw blades secured to said shafts, and wherein said staggered circular saw blades are disposed such that an inner portion of a respective circular saw blade overlies an area occupied by an inner portion of an adjacent lower disposed circular saw blade such that in harvesting a resultant cut stalk segment is cut about one end by a circular saw blade of one shaft and about the other end by another circular saw blade on the other shaft;

(d) drive means operatively connected to said shafts for rotatively driving said shafts and the circular saw blades secured thereon, said driving means for driving said shafts including means for driving said shafts in counter directions relative to each other with the respective circular saw blades secured on each shaft being driven such that the leading cutting edge of the blades generally move in an outwardly directed arcuate path relative to the areas occupied by the inner portions of said blades during the harvesting operation in order that the blades will impart an outward directed flinging action to the cut stalk segments; and

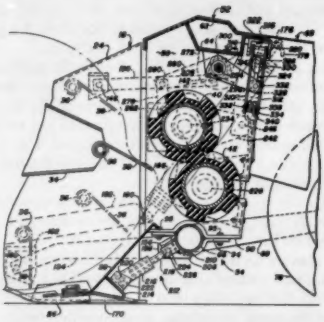
(e) wherein said support frame assembly includes mounting means for pivotably mounting said support frame assembly about a transverse axis relative to said harvester such that said support frame assembly may be angularly adjusted about said transverse axis for positioning the respective circular saw blades in an efficient harvesting posture.

4,174,602

HEADER SUSPENSION AND STABILIZATION MEANS

Bryant F. Webb, Ephrata, and Charles A. Parrish, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 31, 1978, Ser. No. 891,989
Int. Cl.[2] A01D *67/00*
U.S. Cl. 56—208 **9 Claims**



1. In a crop harvesting machine having a crop harvesting header, a mobile frame adapted to move across a field in a forward direction, said mobile frame including upper frame structure extending transversely to said forward direction and a lower wheel frame assembly, said assembly including a cylindrical member extending transversely to said forward direction and rotatably mounted to and supporting said upper frame structure, and lift means on said frame and being actuatable for moving said lower wheel frame assembly, and thereby rotating said cylindrical member thereof, relative to said upper frame structure to effectuate raising of said upper transverse frame structure and said cylindrical member relative to the field between a lower field operating position and an upper transport position, an improved means for suspending said header from said mobile frame so as to dispose said header in a harvesting position adjacent the field when said frame is at its lower field operating position and for lifting said header up-

wardly relative to the field during effectuation of raising of said frame, comprising:

upper means pivotally interconnecting said upper frame structure with an upper portion of said header;

lower elongated means pivotally interconnecting said cylindrical member of said wheel frame assembly with a lower portion of said header, said lower means having a portion which projects rearwardly of the pivotal connection of said lower means with said cylindrical member and underlies said member so as to be engaged by the same to effect lifting of said header upwardly by said lower means upon rotation of said cylindrical member when said lift means is actuated so as to effectuate raising of said upper transverse frame structure and said cylindrical member relative to the field; and

header stabilizing means extending between and pivotally interconnecting a generally central portion of said cylindrical member and a lower generally central portion of said header.

4,174,603

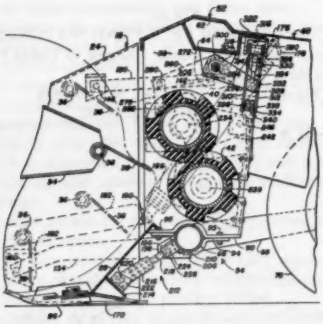
TELESCOPING LATERAL LIMIT LINK

Charles A. Parrish, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 31, 1978, Ser. No. 892,044

Int. Cl.[2] A01D *67/00*

U.S. Cl. 56—208 **9 Claims**



1. In a crop harvesting machine having a mobile frame adapted to move across a field, a crop harvesting header affixed to said frame and selectively movable between a lower field operating position and an upper transport position, an improved means for stabilizing said header against lateral movement, comprising:

a pair of telescopible members, not operable for selectively moving said header between said lower field operating position and said upper transport position, extending between and interconnecting a generally central portion of said frame with a generally central portion of said header for stabilizing said header against the effect of any laterally directed forces which may impinge thereon.

4,174,604

HEDGE TRIMMER APPARATUS

David J. Wilson, Sr., 207 N. Jefferson St., Athens, Ala. 35611, and David J. Wilson, Jr., 2707 Churchill Dr., Huntsville, Ala. 35801

Continuation-in-part of Ser. No. 789,968, Apr. 22, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,699

Int. Cl.[2] A01D *55/02*

U.S. Cl. 56—237 **4 Claims**

1. A carriage for a motorized hedge trimmer comprising:

a rollable first frame adapted to move along the ground, and having a pair of spaced wheels journalled about an axis;

a generally straight, elongated second frame supported by and rising from a point on said axle adjacent to one of said wheels, and including a generally vertically extending guide;

a generally upward extending strut supported adjacent to the other of said wheels on said axle and connecting to an upper point on said second frame;

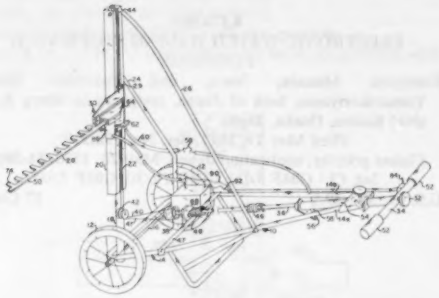
an elevatable base supported by said second guide and adapted to be guided by said guide along said second frame;

support means for supporting a motorized hedge trimmer on said base;

tilt means for adjustably tilting said support means with respect to an axis which is normal to a plane parallel to the axis of said axle;

an operating control assembly comprising:

a triangular-shaped third frame coupled at its base to said



axle and generally lying within a plane which is tilted with respect to said second frame from its base, base of third frame, to its apex,

first control means supported at the apex of said first frame, including a first handle for providing, upon operation, a first bidirectional mechanical output, and

second control means supported at the apex of said third frame, including a second handle for providing, upon operation, a second bidirectional mechanical output;

elevation means responsive to a said first bi-directional output for elevating and lowering said base; and

tilting means responsive to said second bi-directional output for tilting said support means with respect to a line parallel to said axle;

whereby a motorized hedge trimmer attached to said support means may be selectively moved along a hedge and be selectively elevated and tilted.

4,174,605

METHOD OF AND APPARATUS FOR SPINNING YARN IN AN AIR VORTEX IN A SPINNING TUBE

Eduard Pallay, Prague, Czechoslovakia, assignor to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Aug. 16, 1978, Ser. No. 933,991

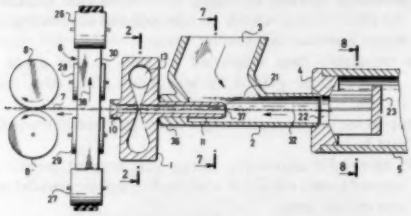
Claims priority, application Czechoslovakia, Aug. 17, 1977, 5393/77

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **12 Claims**

1. A method of spinning yarn of staple fibers in air vortex in a spinning tube by spinning supplied separated fibers onto a rotating open-end of yarn being withdrawn from the spinning tube in counterdirection to a whirling flow of air produced in a pneumatic chamber coupled to the spinning tube, comprising twisting the yarn being built in the pneumatic twisting cham-

ber by means of concentric air streaming producing an excited potential air vortex about the longitudinal axis of said pneu-



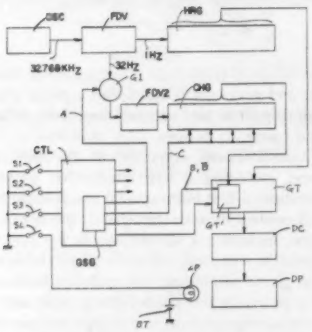
matic twisting chamber and about the yarn passing therethrough.

4,174,606

ELECTRONIC WATCH HAVING STOPWATCH FUNCTION

Toshiyuki Masuda, Nara, and Takehiko Sasaki, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1977, Ser. No. 798,390
Claims priority, application Japan, May 20, 1976, 51-58929
Int. Cl.[2] G04F *8/00*; G04B *19/30*; G04F *7/04*
U.S. Cl. 58—39.5 **17 Claims**



1. A digital display type electronic watch having a stopwatch function, comprising:

means for generating a time reference signal;

means responsive to said time reference signal for generating a chronometrical information signal representative of the measured time information, said measured time information comprising a more significant digit portion and a less significant digit portion;

means responsive to said chronometrical information signal generating means for displaying said measured time information;

means for instructing initiation and termination for defining a time period being measured in terms of said measured time information;

means responsive to said initiation/termination instructing means for coupling said chronometrical information signal generating means to said time reference signal generating means;

sequential response means operatively coupled to said chronometrical information signal generating means and said displaying means for making said displaying means sequentially responsive to one and the other of said more and less significant digit portions of said measured time information said sequential response means further comprising,

means for commanding sequential response of said displaying means to said more significant or the less significant digit portion of said measured time information in said chronometrical information signal generating means; and

means responsive to said sequential response commanding means for selectively and sequentially coupling said displaying means to said more significant or the less significant digit portion of said measured time information in said chronometrical information signal generating means, said sequential response commanding means further comprising,

manually operable sequential response commanding means; and

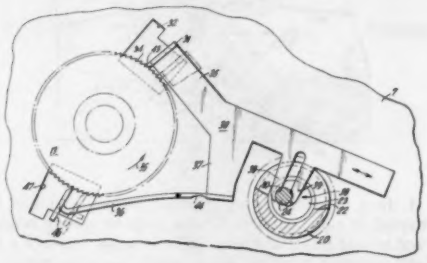
means responsive to said manually operable sequential response commanding means for making a timing operation for providing a timing signal for a predetermined time period, said sequential coupling means being adapted to be responsive to said timing signal of said timing means, whereby said display is switched from one to the other of said more and less significant digit portions of said measured time information in said chronometrical information signal generating means only during said predetermined time period of said timing means.

4,174,607

MECHANISM FOR SELF-WIND WATCHES

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Dec. 13, 1978, Ser. No. 968,956
Int. Cl.[2] G04B *5/02, 7/02*
U.S. Cl. 58—82 A **7 Claims**



1. In a watch including a mainspring driving a time gear train and having reduction gearing for winding the mainspring by unidirectional rotation of a winding pinion, the improvement comprising:

a supporting frame member inside the watch,

a ratchet wheel rotatably mounted on said frame member and operatively connected to drive said winding pinion,

a rotor bushing projecting from said frame member, said bushing having a cylindrical bore,

a rotor staff journaled in said bushing and having an eccentric crank portion,

a rotor attached to said rotor staff and having an off-center mass which causes angular oscillation when the rotor is reoriented by movement of the watch, and

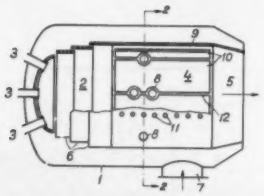
a single piece rocking arm having first and second spring loaded click arms having pawl portions cooperating with opposite sides of said ratchet wheel, and having integral spring clip fingers adapted to snap onto said eccentric crank portion from the side thereof, whereby priodic oscillation of the rotor staff crank causes said click arms to rotate the ratchet wheel and wind the mainspring of the watch.

4,174,608

COMBUSTION CHAMBER FOR A GAS TURBINE

Laszlo Hunyadi, Järfälla; Leif Andersson, and Martin Månsson, both of Finspang, all of Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden

Continuation of Ser. No. 613,580, Sep. 15, 1975, abandoned, and a continuation of Ser. No. 386,288, Aug. 6, 1973, abandoned.
This application Feb. 7, 1977, Ser. No. 766,570
Claims priority, application Sweden, Aug. 15, 1972, 10548/72
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—39.65 2 Claims



1. A combustion system for turbines and the like, comprising:

(a) a flame tube having means (3) for admitting a mixture of fuel and primary combustion air;

(b) a shell (1) surrounding said flame tube and defining an annular air space surrounding said flame tube;

(c) said flame tube comprising a combustion chamber (2) and a mixing chamber (4) in which the hot gases passed from the combustion chamber are mixed with diluting air;

(d) said mixing chamber (4) being defined within a double wall construction comprising a relatively thick outer wall (9) supporting said flame tube within said shell and a relatively thin inner wall (10) of heat resistant material, which is supported by the outer wall and which forms a coaxial annular cooling jacket surrounding said mixing chamber;

(e) conduit means (7) for passing pressurized air into said annular air space;

(f) a plurality of cooling apertures (11) spaced about the periphery of said outer wall for admitting a portion of said pressurized air into said cooling jacket;

(g) a plurality of nozzle means (8) spaced alternately with said cooling apertures about the periphery of said cooling jacket for directing a diluting stream of said pressurized air radially into said mixing chamber;

(h) said inner wall having diluting apertures (12) aligned with said nozzle means;

(i) the spacing between said cooling apertures (11) and said diluting apertures (12) being effective to produce high velocity air streams diverging in opposite directions within said jacket from said cooling apertures (11) to said diluting apertures (12) to cool said outer and inner walls (9, 10) preliminary to their injection into said mixing chamber along with said diluting stream.

4,174,609

LOCKING SYSTEM FOR SLIDING COWLINGS OF TURBOJET ENGINE NACELLES

Paul J. Legrand, Vaux le Penil, and Henry Naud, Verrieres le Buisson, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 7, 1978, Ser. No. 875,916
Claims priority, application France, Feb. 8, 1977, 77 04140
Int. Cl.[2] F02C 7/20; E05C 5/00, 19/12
U.S. Cl. 60—262 10 Claims

9. Aircraft bypass turbine engine of the type which comprises, in the upstream to downstream direction of the flow of air, a fan turning within a first housing, at least one compressor, a combustion chamber, these latter components being placed within a second housing connected with the first, the said turbine engine being enclosed in a nacelle comprising a forward portion forming an air intake, a middle portion and a sliding, annular rear portion which channels the air exiting from the fan, the first housing having a flange located downstream thereof and fixed with respect thereto, the sliding, annular rear portion of the nacelle being made integral with a flange located downstream of the fan housing by a device comprising:

means for centering and angularly positioning the rear portion with respect to the flange;

means for absorbing stresses acting in the direction of the joining plane of the flange and the rear portion;

means for holding the rear portion tight against the flange and ensuring the transmission of longitudinal stresses between the flange and the rear portion, said holding means comprising a plurality of circumferentially spaced lockbolts, and

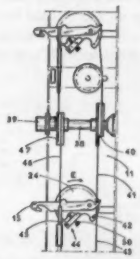
means for synchronously controlling said lockbolts, each lockbolt comprising:

first stationary support on the flange;

a strap mounted on said first support;

a second support attached to the rear portion;

a hook on one end of said tie bar, said hook cooperating with said strap;



a pivot shaft at the other end of said tie bar;

a slide track in said second support, said pivot shaft cooperating with said slide track for translational movement therealong;

means coupled with said tie bar for driving the same;

said driving means including a moving part having an axis defined by a fixed shaft, said fixed shaft being parallel to said pivot shaft, said driving means being actuated by said controlling means;

said moving part including a cam which cooperates with said pivot shaft of said tie bar, said cam having a first section of evolutional radius with respect to the axis of the moving part and a second section which transitions from the end of the largest radius of said first section and has constant radius with respect to the axis of the moving part;

means for disengaging said hook from said strap by pivoting said tie bar from its direction of translation at its fully extended position; and

take-up and holding means between said rear portion and said tie bar for restraining said tie bar to translational movement except when pivoted by said disengaging means.

4,174,610

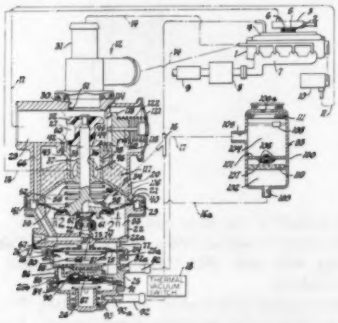
POWER CRUISE DIVERTER VALVE

Thomas J. Hollis, Fairport, N.Y., and William F. Thornburgh, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 1, 1978, Ser. No. 901,569
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—290 2 Claims

1. An air control valve for use with an internal combustion engine having an induction system, an exhaust emission control system including an exhaust manifold connected to the engine for receiving exhaust gases discharged from the exhaust ports

of the engine and, a driven air pump for providing secondary air to the exhaust emission control system with flow thereto controlled by said air control valve, said air control valve including a housing means having a valve chamber therein with an inlet connectable to the air pump, a first outlet connectable to the exhaust emission control system and a second outlet adapted for discharging secondary air to the atmosphere, said housing means further including a first valve seat in said valve chamber surrounding said first outlet and a second valve seat, diametrically opposite said first valve seat, surrounding said second outlet, a valve member positioned in said valve chamber or movement between a first position in engagement with said first valve seat and a second position in engagement with second valve seat, actuator means with a timing valve means therewith including a switching diaphragm operatively connected to said valve member for effecting movement of said valve member between said first position and said second position, said actuator means further including first spring means operatively associated with said valve member to normally bias said valve member to said second position, said switching diaphragm being positioned in a first portion of said valve housing means to form therewith a first vacuum chamber on one side of said switching diaphragm and a first pressure chamber on the opposite side of said switching diaphragm, fluid passage means in said housing means in communication at one end with said first pressure chamber and at its other end in communication with said inlet, a first vacuum post



means in said housing means opening into said first vacuum chamber and connectable to the engine induction system, a first valve means operatively positioned in said housing means for movement to control fluid flow through said fluid passage means into said first chamber, said first valve means including a second actuator means having a second diaphragm forming with a second portion of said housing means a second chamber on one side of said diaphragm and located next opposite side next adjacent said first chamber, said second chamber being in communication with the atmosphere, and a second vacuum chamber on the opposite side of said second diaphragm, a second vacuum port means in said housing opening into said second vacuum chamber and connectable at its opposite end to the induction system of the engine, said first valve means further including a second spring means operatively positioned on one side of said second diaphragm to normally bias said first valve means into a position permitting fluid flow through said fluid passage means into said first chamber, an atmospheric air inlet means in said second portion of said housing means in fluid communication at one end with said second vacuum chamber and, a second valve means operatively positioned in said housing means for movement to control fluid flow through said atmospheric air inlet means, said second valve means including a third actuator means having a third diaphragm forming with a third portion of said housing means a third pressure chamber on one side of said third diaphragm in communication with said atmospheric air inlet means and a third vacuum chamber on the opposite side of said third diaphragm, said third actuator means further including a third spring means operatively associated with said third diaphragm to normally effect movement of said second valve means to a position blocking flow through said inlet port means, a third vacuum port means in said third portion of said housing means opening at one end into said third vacuum chamber and at its other end being connectable to the induction system of the engine, and passage means in said housing means opening at one end into said third pressure chamber and in communication at its opposite end with the atmosphere.

4,174,611

HYDRAULIC MACHINE

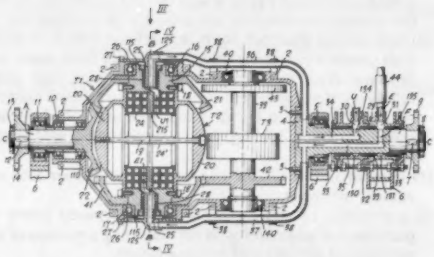
Gino Franch, Via G. Avezzana 10, Milan, Italy

Filed Mar. 14, 1978, Ser. No. 886,924

Claims priority, application Italy, Mar. 17, 1977, 4816 A/77; Mar. 17, 1977, 4817 A/77

Int. Cl.[2] **F16D** *33/00*

U.S. Cl. 60—325 **15 Claims**



1. A hydraulic machine, which can be used at will as a pump or as a torque transducer, comprising:

(a) an outer rotor rotatably mounted on a machine frame around a first rotational axis and connectable, through an input shaft, to a driving motor;

(b) an inner rotor mounted at the interior of the outer rotor, said inner rotor being rotatable around a second rotational axis which is perpendicular to said first axis of the outer rotor, and which is connected through a gear drive to an auxiliary shaft coaxial to said input shaft and to said first rotational axis of the outer rotor;

(c) means for securing said auxiliary shaft to the machine frame or to a transmission, utilizer or control device;

(d) a hydraulic circuit arranged at the interior of the inner rotor, presenting at least one active circuit, the projection of which on a plane passing through said second rotational axis of the inner rotor defines a final surface different from zero;

(e) rotary connection means for sealingly connecting the ends of the active circuit with a fixed inflow and a fixed outflow connection;

whereby to the inner rotor there is associated a field of accelerations of Coriolis which depends on the angular speeds of the outer rotor and of the inner rotor, said field generating, between the ends of the active circuit and more precisely between the inflow and the outflow connections, a pressure difference in the field contained in the hydraulic circuit, which pressure difference is substantially sinusoidally varying.

4,174,612

PRESSURE AGENT CONTROL ARRANGEMENTS, ESPECIALLY FOR HYDRAULIC STEERING ARRANGEMENTS FOR MOTOR VEHICLES

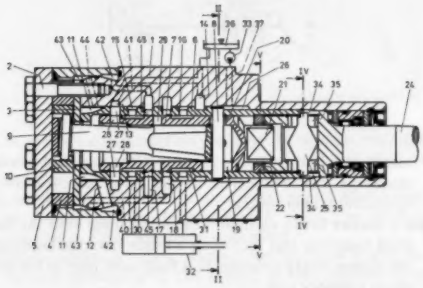
Karl-Heinz Liebert, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,852

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2712920

Int. Cl.[2] F16D *31/00*

U.S. Cl. 60—384 5 Claims



1. In a booster steering system having a servopump, a metering pump, a servomotor, a tank, and a control valve, including connection means therebetween wherein said control valve has a housing having a pair of concentric valve sleeves therein shiftable relative to each other, there being passage means for said housing and for said valve sleeves for selective coaction responsive to the relative positions of said valve sleeves to selectively control flow between said servopump, said metering pump, said tank and said servomotor; one said valve sleeve **6**) being connected for delayed rotation of said metering pump to manual rotating means, and the other said valve sleeve **7**) being directly connected for rotation by manual rotating means; said passage means comprising passages **(27)** in said one valve sleeve coacting with passages **(28)** in the said other valve sleeve by being shiftable into and out of register for controlling flow through said control valve, effecting circulation of pressureless hydraulic fluid from said servopump to said tank in a neutral position of said valve sleeves for straight ahead steering and blocking said flow in a steering control position for a turn, wherein said one valve sleeve is a metering pump flow control valve and initially held against rotation by said metering pump in neutral position of said one valve sleeve while the other said valve sleeve is initially movable; the improvement which comprises: means intermediate said valve sleeves constructed and arranged to effect initial rotation of said other valve sleeve with simultaneous axial shift relative said valve sleeves when said one valve is stationary to effect reaction support for forces acting on said other valve sleeve; whereby the resultant relative traverse between said valve sleeves is increased beyond that for purely axial or purely rotative shift for the same extent of actuation of said manual rotating means, and wherein said valve sleeve passages **(27,28)** are of a size commensurate with the resultant traverse of combined motions so as to reduce abruptness in change of flow area cross section between said coacting passages when said valve sleeves are shifted.

4,174,613

LOAD RESPONSIVE VALVE ASSEMBLIES

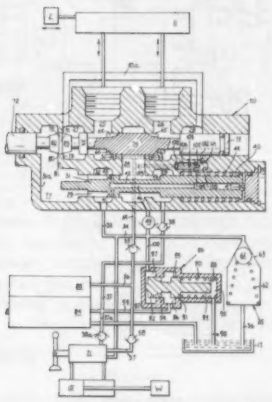
Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 522,324, Nov. 8, 1974, Pat. No. 3,998,134, and a continuation-in-part of Ser. No. 559,818, Mar. 19, 1975, Pat. No. 3,984,979, and a continuation-in-part of Ser. No. 655,561, Feb. 5, 1976, Pat. No. 4,099,379. This application Jul. 27, 1976, Ser. No. 709,204

The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.

Int. Cl.[2] F15B *13/08*

U.S. Cl. 60—427 22 Claims

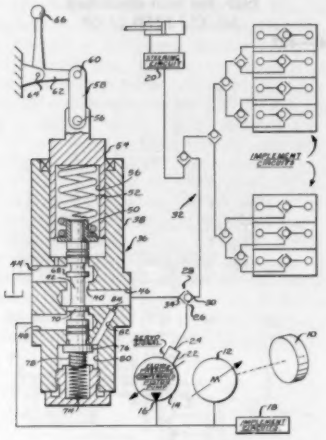


1. Multiple load responsive valve assemblies each comprising a housing having a fluid inlet chamber connected to pump means, a fluid supply chamber, at least one load chamber, outlet fluid conducting means and fluid exhaust means connected to reservoir means, first valve means for selectively interconnecting said fluid load chamber with said fluid supply chamber and said fluid exhaust means, said first valve means having first variable metering orifice means operable to throttle fluid flow between said load chamber and said fluid exhaust means and second variable orifice means operable to throttle fluid flow between said fluid supply chamber and said load chamber, pressure sensing port means selectively communicable with said load chamber by said first valve means, second valve means having out flow throttling means between said load chamber and said fluid exhaust means, said second valve means having means responsive to pressure differential at variable pressure level across said first variable orifice means and operable to maintain said pressure differential across said first variable orifice means at a relatively constant preselected level while pressure at said first variable orifice means is permitted to vary, said second valve means having fluid isolating means between said fluid inlet chamber and said fluid supply chamber, fluid replenishing means to interconnect for fluid flow said fluid supply chamber and said fluid exhaust means when said fluid isolating means isolates said fluid supply chamber and said fluid inlet chamber, and control means connected to said inlet chambers of said valve assemblies, control line means interconnecting said control means with said pressure sensing port means of said valve assemblies, control signal direction phasing means in each of said control line means, said control means responsive to highest pressure in any of said load chambers of valve assemblies operating loads and operable to vary fluid flow delivered from said pump means to said load system to maintain a constant pressure differential across said second variable orifice means between pressure in said inlet chambers and said maximum pressure in said load chamber.

4,174,614
TORQUE LIMITING CONTROL FOR FRONT WHEEL DRIVE

Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 1, 1978, Ser. No. 874,080
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—445 5 Claims



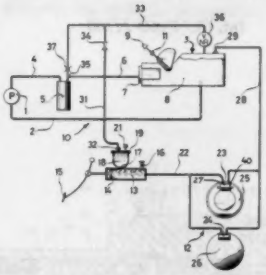
1. A vehicle drive system comprising:
ground engaging means adapted to at least partially propel a vehicle over underlying terrain;
a hydraulic motor coupled to said ground engaging means to drive the same;
a flow and pressure compensated pump having an output for providing hydraulic fluid under pressure to said motor and including a control system having an input for receiving a hydraulic signal and for controlling pressure and flow output characteristics of the pump; and
a manually settable pressure reducing valve interconnecting said output and said input to provide a substantially constant, but adjustable, pressure signal to said control system,
whereby output pressure from said pump to said motor may be controlled independently of loading on said motor to set maximum torque delivery of said motor at a desired value.

4,174,615
DEVICE FOR THE VENTING OF AN HYDRAULICALLY LOADED SYSTEM

Wolfgang Kuhn, Kaarst, Fed. Rep. of Germany, assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 10, 1978, Ser. No. 950,094
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 7732163[U]
Int. Cl.[2] F15B *21/04*
U.S. Cl. 60—453 4 Claims

1. An auxiliary hydraulic fluid circuit for purging air from a hydraulic brake system in a tractor vehicle of the agricultural or industrial type by diverting hydraulic fluid from a hydraulic power system on the tractor into the hydraulic brake system, comprising:
a hydraulic feed line means for supplying fluid to the hydraulic power system;
a first conduit having means for observing fluid flow therethrough and having an intake end connected to the feed line and having a discharge end connected to a one way valve communicating with a fluid reservoir of the hydraulic power system;
a second conduit having means for observing fluid flow therethrough and having an intake end connected to the first conduit upstream of the one way valve and having a discharge end connected to a brake fluid reservoir;
a fluid control valve means in the second conduit for controlling the flow of fluid therethrough;
a third conduit having means for observing fluid flow therethrough and having an intake end connected to a vent

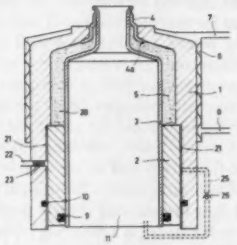


means in a brake servo cylinder unit means and having a discharge end connected to the fluid reservoir of the hydraulic power system;
and a master brake cylinder communicating with the brake fluid reservoir and including a brake line communicating the master brake cylinder to a fluid inlet port in the brake servo cylinder unit.

4,174,616
INSULATED CYLINDER SLEEVE FOR A HOT-GAS ENGINE

Anton M. Nederlof, and George A. A. Asselman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,460
Claims priority, application Netherlands, Aug. 5, 1976, 7608689
Int. Cl.[2] F16J *11/04*; F02G *1/04*
U.S. Cl. 60—517 6 Claims

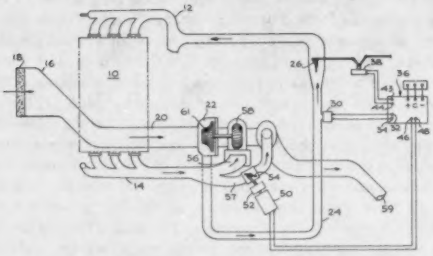


1. A hot-gas engine, comprising at least one metal housing which envelops a chamber in which a pressurized working medium is present during operation, and a layer of a heat insulating material on at least part of the inner side of the housing, characterized in that the engine includes a metal sleeve bounding a portion of the chamber and defining an inner wall of an annular spaced formed at least substantially by the inner wall of the housing and the metal sleeve, the insulating layer consisting of granular material filling the annular space such that the metal sleeve presses against and is supported by the grains of insulating material, whereby the insulating material provides structural support for the sleeve against the effects of internal pressure in the chamber.

4,174,617
TURBOCHARGER CONTROL SYSTEM

Mir Javid Jalali-Karchay, P.O. Box 300, Monrovia, Calif. 91016

Filed Aug. 8, 1977, Ser. No. 822,394
Int. Cl.[2] F02B *37/00*
U.S. Cl. 60—602 **10 Claims**



1. A turbocharger control system for an internal combustion engine having a throttle, an intake manifold and an exhaust manifold, including:

a pressure sensor coupled to said intake manifold and responsive to changes in the air pressure therein to produce a change in a first electrical parameter;

variable electrical means coupled mechanically to said throttle and responsive to the setting of said throttle to set a second electrical parameter of the same type as first electrical parameter;

a comparator circuit including balanced means for comparing the respective total magnitudes of said first and second parameters and trigger means responsive to any imbalance between said total magnitudes of said first and second parameters for producing a correctional output voltage having a polarity indicative of the relative sizes of said total magnitudes of said first and second parameters, respectively;

a gas-driven turbine;

an exhaust gas duct adapted to be coupled at one end to said exhaust manifold and at the other end to said turbine;

an air duct coupled to said intake manifold;

an air compressor;

coupling means for mechanically coupling said air compressor to said turbine, said air compressor being pneumatically coupled to said air duct for the flow of air therebetween;

a by-pass duct coupled to said exhaust-gas duct between said exhaust manifold and said turbine for by-passing exhaust gas around said turbine;

a wastegate adjustably mounted in said by-pass duct for controlling the extent of the by-passing of exhaust gas around said turbine;

a reversible electrical motor having electrical terminals;

driving means coupling said motor to said wastegate; and,

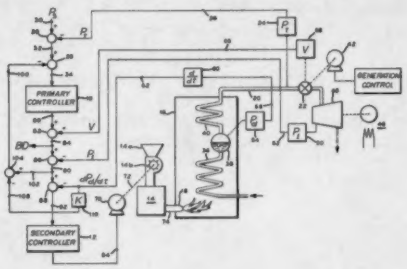
electrical means coupling said terminals of motor to said comparator circuit for operating said motor, in response to said correctional output voltage, in such a direction that said wastegate is positioned to cause the restoration of the balance between the total magnitudes of said first and second parameters, respectively.

4,174,618
DECOUPLED CASCADE CONTROL SYSTEM

Theron W. Jenkins, Jr., Ambler, and Justus C. Barber, King of Prussia, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Apr. 3, 1978, Ser. No. 892,537
Int. Cl.[2] F01K *13/02*
U.S. Cl. 60—664 **6 Claims**

1. In a cascade control system for controlling the steam boiler of the drum type wherein a primary controller having proportional and reset action responds to the deviation of the throttle pressure from its set point to establish as an output a set point value representing heat release demand with a secondary controller responding to the deviation of the calculated existing heat release from the demand value represented by said set point to control the fuel input to the boiler, the improvement which comprises:

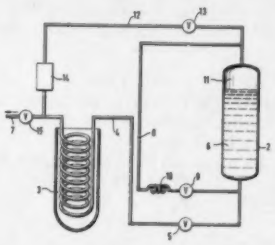


means responsive to the difference between the heat release demand and the existing steam flow to modify the output of said primary controller by an amount sufficient to cancel any changes in said output due to changes in the throttle pressure resulting from disturbances which are detectable as changes in the existing steam flow.

4,174,619
APPARATUS FOR CONTROLLING THE PRESSURE OF A GAS IN A GAS LINE

Klaus Tocha, Langenfeld, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 876,891
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1977, 2706484
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—52 **8 Claims**



1. An apparatus for controlling the pressure of a gas in a gas line, a predetermined pressure prevailing in said gas line, comprising a conduit, said conduit including in combination:

an insulated container,

a source of gas having a relatively low boiling point and being maintained at a prearranged gas pressure within said container, a portion of said gas being in said container in liquefied form, the remaining gas portion being in gaseous form and occupying a gas space within said container,

evaporation-inducing means connected to said portion of gas in liquefied form, and to said gas line, for evaporating said gas in liquefied form, and for generating a gas flow to said gas line, pressure fluctuations occurring in said gas flow,

a feed line disposed in parallel with said evaporation-inducing means and connecting said gas space to said gas line, said gas space being maintained at a prearranged pressure,

and a predetermined pressure loss occurring in said feed line, and

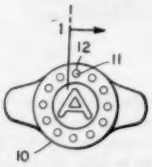
self-actuating valve means disposed in said feed line for releasing a gas stream from said gas space upon the predetermined pressure in said gas line falling below said prearranged pressure less said pressure loss, whereby the pressure in said gas line is substantially maintained at said predetermined pressure, and insulated from pressure fluctuations in said gas flow.

4,174,620

JEWELRY WITH ADHESIVE INSERT FOR LIFTING OBJECTS

David E. Russell, 110 Riverside Ave., Jacksonville, Fla. 32202

Filed Jul. 5, 1977, Ser. No. 812,518
Int. Cl.[2] A44C *9/00*; B65G *7/12*
U.S. Cl. 63—1 R **3 Claims**



1. An article of personal jewelry having a size and shape adapting it for attachment to a portion of a wearer's body at an area near a free end of an arm, said article having an outer surface facing generally away from a wearer's body area, contacting means supported by and protruding outwardly away from said surface and facing away from a wearer's body area for contacting and lifting small, light objects, said contacting means comprising a plastic element with a sticky exterior surface positioned to readily contact such objects, and mounting means for firmly and removably securing said element to said article whereby said element may be readily replaced when said element is substantially incapable of lifting small, light objects,

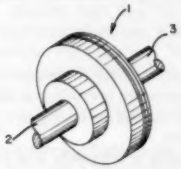
said surface including an ornamental design, said contacting means being adapted and arranged to harmonize with said design thereby rendering same unobtrusive.

4,174,621

TORQUE LIMITING OVERLOAD COUPLING

Duane W. Woltjen, Manchester, Mo., assignor to UMC Industries, Inc., St. Louis, Mo.

Filed Oct. 12, 1977, Ser. No. 841,364
Int. Cl.[2] F16D *3/56, 7/00*
U.S. Cl. 64—29 **16 Claims**



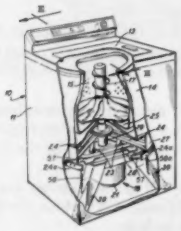
1. A torque limiting coupling assembly for use in connecting rotating and rotatable parts together during normal usage of machinery but effecting disconnecting of said parts when a maximum designed torque is exceeded, comprising, connecting means provided for securement with the said rotating part, a second connecting means provided for securement with the said rotatable part, bearing means, bearing seats operatively associated with each connecting means and for use in seating the bearing means, said bearing means being seated intermediate the two said connecting means and effecting simultaneous turning of said rotatable part by the rotating part during routine operation of the machinery and with the exertion of excessive torque causing a camming action between the bearing means and its bearing seats for effecting an unseating of said bearing means and reduction in the rotation of said rotatable part, a retainer means holding said bearing means between the said connecting means, diaphragm means having one of connecting means formed bearing seats provided thereon cooperating with one of said connecting means for normally seating the said bearing means into position for turning with the revolving of the rotating part, tapered pin means cooperating between the said connecting means and seated within the diaphragm means for assuring the simultaneous rotation of both the said connecting means and bearing means during routine machinery usage, the excessive torque also effecting a camming action between the pin means and its seats tending to cause their movement towards separation, resilient means provided upon the said connecting means and biasing the said diaphragm means against the bearing and pin means, and other bearing seats operatively associated with the said other connecting means and seating the bearing means thereagainst as during designed usage of the said machinery.

4,174,622

AUTOMATIC WASHER SUSPENSION SYSTEM

Douglas E. Bunnell, Marion, Ohio; Joseph A. Gauer, Buchanan, Mich.; R. Bruce Sherer, and William F. Scott, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 27, 1978, Ser. No. 928,714
Int. Cl.[2] D06F *37/24*
U.S. Cl. 68—23.3 **19 Claims**



1. In an automatic clothes washer having a spin type clothes container within which an agitator is oscillatably mounted, a tub enclosing and supporting the container, means supported substantially centrally on and under the tub for driving the container and agitator, and suspension means supporting the tub in a manner to permit limited rocking and transverse displacement movements of the tub during a cycle of operation, the improvement in the suspension means comprising:

a combination skate and rocking support device;

support means supporting said device under said tub for horizontal movement of said device relative to said support means;

generally pyramidally oriented cooperative surfaces on said tub and on said device for supporting said tub on said device and for providing stable support for the tub under normal operating conditions but permitting rocking of the tub relative to the device responsive to tub load imbalances in operation;

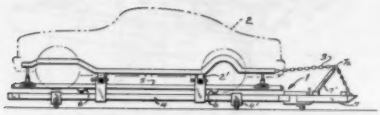
and resiliently yieldable means for normally biasing said tub and thereby said device toward an equilibrium position.

4,174,623

METHOD AND APPARATUS FOR REFORMING AND STRAIGHTENING VEHICLES

Pierre N. LeGrand, Old MBI Bldg., Brunswick Rd., Ashford, Kent, England, and Dirk J. Van Dalen, 701 E. Milwaukee, Janesville, Wis. 53545

Filed Sep. 8, 1977, Ser. No. 831,508
Int. Cl.[2] B21D *1/14*; B21C *51/00*
U.S. Cl. 72—34 **16 Claims**



1. An apparatus for applying corrective forces to the body and/or frame of a damaged vehicle comprising:

support means on which a damaged vehicle is positionable;

force applying means coupled to the support means for applying a corrective force to the damaged vehicle through an elongated force transmitting element;

measuring means having interconnected tracks and disposed for movement on the support means and including means for selective and independent movement of the measuring means with respect to the damaged vehicle and with respect to the support means on which the damaged vehicle is positionable, the means for selective and independent movement including resilient biasing and rolling means disposed between the support means and the tracks for biasing the measuring means into operative coupling relationship with the damaged vehicle and permitting rolling movement between the measuring means and the support means, the measuring means including indicating means responsive to the application of a corrective force to the damaged vehicle to provide a continuous indication of the magnitude of correction of the damaged vehicle;

said measuring means further including a plurality of vertically extending and vertically presettably adjustable reference elements having respective first and second ends, the respective first ends thereof biased by said resilient biasing means into operative coupling relationship with datum points on undamaged portions of the vehicle to provide predetermined reference positioning of the measuring means with respect to the vehicle;

said measuring means further including at least one vertically extending extensible measurement element having a first and a second end, the first end thereof biased by said resilient biasing means into operative coupling relationship with a datum point on damaged and unaligned portions of the vehicle;

said measuring means further including independent support means mounted on said tracks to respectively support the second ends of the plurality of reference elements and to support the second end of said at least one measurement element, said independent support means capable of movement on the tracks in at least two directions; and

retention means disposed between the independent support means of the reference elements and the tracks to provide a preselected orientation of the measuring means with respect to the vehicle and to the independent support means during the application of a force to the vehicle.

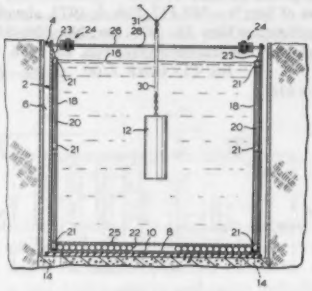
4,174,624

TANK FOR EXPLOSIVE FORMING

Lorne R. Shrum, 820 Manchester Rd., London, Ontario, Canada

Filed Jul. 26, 1978, Ser. No. 928,187
Claims priority, application Canada, Jul. 29, 1977, 283744
Int. Cl.[2] B21D *26/08*
U.S. Cl. 72—56 **5 Claims**

1. A tank for explosive forming comprising an open topped tank cushionedly free-standing within a ground excavation, the tank being cylindrical about a vertical axis, and a substantially horizontal annular plate located within the upper rim of the



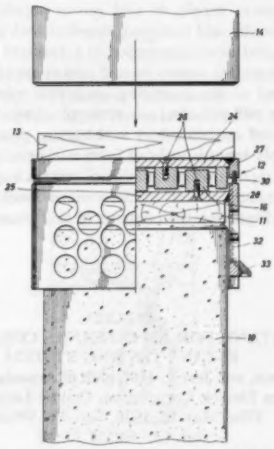
tank, the plate being spaced from and connected to said upper rim by a plurality of rubber-in-shear mountings.

4,174,625

TRANSDUCER FOR DETERMINING STRAIN DATA DURING PILING

Lionel J. Milberger, 19402 Enchanted Oaks Dr., Spring, Tex. 77373, and Byrd M. Sasser, Jr., 8B, Southside, College Station, Tex. 77840

Filed Mar. 2, 1978, Ser. No. 882,572
Int. Cl.[2] G01N *3/32*
U.S. Cl. 73—11 **5 Claims**



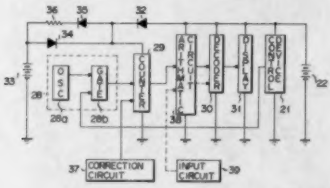
5. A strain gauge transducer for use in determining strain data during piling comprising a generally flat-sided metal body for positioning between the top of a pile and a pile driving hammer, said plate having a plurality of symmetrically spaced flexure elements formed therein that extend above the adjacent surface of the body on one side and are recessed relative to the adjacent surface of the body on the other side, a plurality of arms integrally attached to the flexure elements and the body, and extending between the flexure elements and the body with adjacent arms having mutually perpendicular longitudinal axes, and strain gauges positioned on the arms to measure the strain in the arms due to the force imposed on the flexure members by a hammer.

4,174,626

FUEL GAUGE

Yasushi Agawa, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 767,117, Feb. 9, 1977, abandoned. This application May 25, 1978, Ser. No. 909,485
Claims priority, application Japan, Feb. 10, 1976, 51-13554
Int. Cl.[2] G01F *9/00*
U.S. Cl. 73—113 **2 Claims**



1. A gauge for measuring fuel consumption in an engine employing an electronic fuel injection control system having means for generating a control signal for controlling the opening and closing of a fuel injection valve, said control signal including a series of control pulses for controlling the opening of said valve wherein the width of each pulse corresponds to the time said valve is open during each injection cycle, said gauge comprising: a clock pulse generator for generating clock pulses; a logic gate circuit for passing, in response to each said control pulse, a number of clock pulses corresponding to the width of said control pulse; an electronic counter connected to said logic gate for counting the clock pulses passed by said logic gate circuit; a principal power supply for energizing said counter through a power supply input thereto; a backup power supply; a first diode connected in a forward direction from said principal power supply to said power supply input of said counter whereby said counter is supplied with power for operation; a second diode connected in a forward direction from said backup power supply to said power supply input of said counter, said diodes operating such that when the voltage output from said principal power supply drops below a predetermined level established by said backup power supply, said power supply input is isolated from said principal power supply and is supplied with power from said backup power supply to be maintained at said predetermined level; and a display device for displaying the contents of said counter.

4,174,627

TEST STAND FOR AN INTERNAL COMBUSTION ENGINE TESTING SYSTEM

Philip E. Swis, and Jere L. Hill, both of Armada, Mich., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed May 16, 1978, Ser. No. 906,643
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—116 **22 Claims**

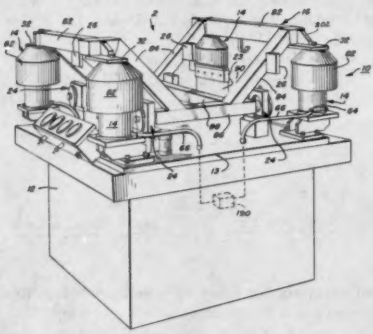
1. An apparatus for permitting a mechanism mounted thereon to substantially freely vibrate, said apparatus being operable in a first state and a second state and comprising, in combination:

a platform;

cradle means for receiving said mechanism, said cradle means resting upon said platform in said first state; and

support means for supporting said cradle means above said platform in said second state and for permitting said cradle means to substantially freely move in response to said mechanism;

said support means including a housing, having a lower end secured to said platform and an open upper end, and an inflatable bladder member within said housing, said inflatable bladder member being deflated in said first state and



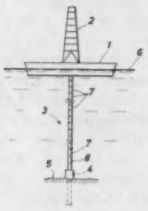
inflated in said second state to engage and lift said cradle means.

4,174,628

MARINE RISER MEASURING JOINT

Hendrik K. J. van den Bussche; Nicolaas J. van Soldt; Adrianus H. van de Krogt, all of Rijswijk, Netherlands, and Willem Drinkwaard, deceased, late of Papendrecht, Netherlands (by Adriana Drinkwaard, née Goossen, personal representative), assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 10, 1978, Ser. No. 923,122
Int. Cl.[2] G01L *5/00*
U.S. Cl. 73—151 **6 Claims**



1. Marine riser joint for measuring loads exerted on a marine riser, said joint comprising a first and a second tubular element, means on each of said first and second tubular elements for coupling the joint to sections of the marine riser, a third tubular element extending between the first and second tubular element and in fluid sealing contact therewith near its ends in a manner allowing relative axial displacement between the third element and at least one of the other elements, a load-transmitting element having a shear load area and forming a firm connection between the first and second tubular element, and stress measuring elements operatively carried by said load-transmitting element.

4,174,629

DETECTION OF DRILLING OIL FILTRATE INVASION IN A CORE

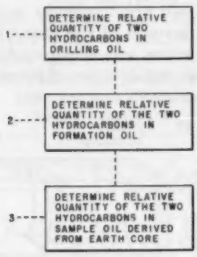
John H. Striegler, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 25, 1978, Ser. No. 954,391
Int. Cl.[2] E21B *49/02*
U.S. Cl. 73—153 **15 Claims**

1. In the analysis of sample oil derived from a core taken from a subsurface formation containing formation oil, said core having been subjected to the presence of an oil base drilling fluid using a drilling oil that has a hydrocarbon analysis different from said formation oil, the method comprising:

a. determining the relative quantities of at least two different hydrocabon materials in said drilling oil;

b. determining the relative quantities of said hydrocarbon materials in said formation oil, said relative quantities of said hydrocarbon materials in said formation oil being different from said relative quantities of said hydrocarbon materials in said drilling oil by an amount such that the relative quantities of said hydrocarbons in a mixture of


1
DETERMINE RELATIVE QUANTITY OF TWO HYDROCARBONS IN DRILLING OIL
2
DETERMINE RELATIVE QUANTITY OF THE TWO HYDROCARBONS IN FORMATION OIL
3
DETERMINE RELATIVE QUANTITY OF THE TWO HYDROCARBONS IN SAMPLE OIL DERIVED FROM EARTH CORE

said drilling oil and said formation oil containing ten percent by weight of said drilling oil are measurably different from the relative quantities of said hydrocarbons in said drilling oil and formation oil; and

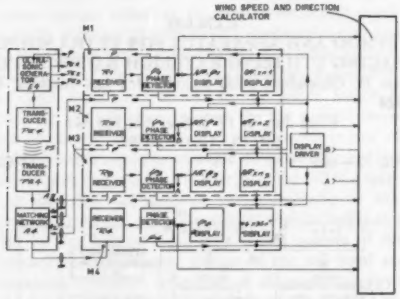
c. determining in said sample oil the relative quantities of said hydrocarbon materials to establish whether said core has been noticeably invaded by drilling oil when said core was subjected to the presence of said oil base drilling fluid.

4,174,630

ULTRASONIC ANEMOMETER

Jacques A. G. Nicoli, Paris, France, assignor to Societe d'Exploitation de Produits et de Techniques pour l'Aeronautique et l'Automatique, Paris, France

Filed Nov. 3, 1977, Ser. No. 848,232
Int. Cl.[2] G01P *5/00*; G01F *1/66*
U.S. Cl. 73—194 A **14 Claims**



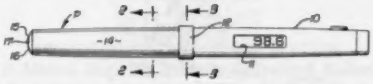
8. An ultrasonic anemometer comprising three transmitter-receiver pairs, the transmitter and receiver of each pair being spaced apart along one of three mutually perpendicular axes, an ultrasonic wave generator electrically coupled to said transmitter and energizing said transmitter to produce acoustic waves, a supporting structure supporting said transmitter-receiver pairs so that said transmitter-receiver pairs define a rectangular tetrahedron, a phasemeter coupled to each receiver, and calculating means responsive to signals from said phasemeter for determining wind velocity.

4,174,631

CLINICAL THERMOMETER WITH THERMO-COUPLE PROBE

Julius G. Hammerslag, Newport Beach, Calif., assignor to Temp-Stik Corporation, Laguna Hills, Calif.

Filed Jan. 9, 1978, Ser. No. 867,975
Int. Cl.[2] G01K *7/02*
U.S. Cl. 73—359 R **23 Claims**



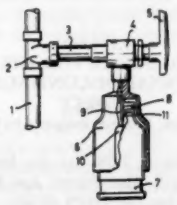
1. An electrical clinical thermometer comprising display means for indicating a sensed temperature, a temperature sensing probe, and a releasable connector means for connecting said probe to said display means, said probe including an elongated support body, non-self-supporting thin thermo-couple wires extending along and supported by said body from said connector means and terminating in a thermo-couple junction adjacent to the end of said body, said junction being formed between ends of said wires which are bared and which are suspended in spaced relation to the material of said body to be exposed for direct contact with the tissue of a patient, said junction being in a gap free of contact with any solid material.

4,174,632

LIQUID SAMPLER

Adolf E. Jansen, Rotterdam, Netherlands, assignor to Douwes International B.V., Pijnacker, Netherlands

Filed Jun. 29, 1978, Ser. No. 920,521
Claims priority, application Netherlands, Jul. 6, 1977, 7707477
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—422 R **5 Claims**

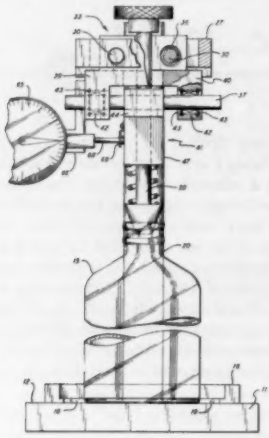


1. A sampler which can be connected to a manufacturing process portion for taking samples therefrom, comprising a tap in a branch line of the process portion, and a cap which is integrally formed with the tap and is adapted to receive a collection container which is inserted into the cap, the configuration of the internal surface of the cap corresponding to the configuration of the external surface of the collection container, and the sampler further comprising an injection needle disposed within the cap for penetrating a septum in the opening of the collection container when the container is inserted into the cap, the needle being in communication with the tap for introducing a sample of fluid from said branch line into the container.

4,174,633
BOTTLE TESTING APPARATUS

Donald A. Hoyt, Fulton, and Harold L. Fischer, New Haven, both of N.Y., assignors to Fulton Tool Co., Inc., Fulton, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,882
Int. Cl.[2] G01D *21/00*
U.S. Cl. 73—432 R 8 Claims



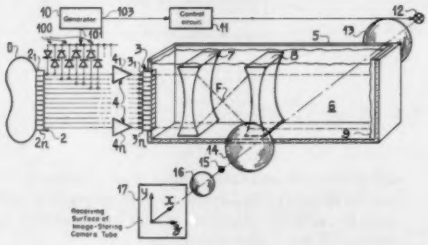
1. Apparatus for inspecting bottles including
a horizontal support platform having a locating fixture thereon for engaging the base of a bottle positioned on the platform and supporting the bottle in an upright position thereupon,
a frame mounted over the platform having a first carriage slidably mounted therein so as to move along a first path of travel parallel to the base,
a second carriage slidably mounted in the first carriage so as to move along a second path of travel that is also parallel to the base and which is angularly offset from the first path of travel,
a probe affixed to the second of said carriages for movement therewith having a plug insertable within a bottle opening in contact with the inner wall thereof, and
means for detecting the displacement between the carriages as a bottle is rotated about its base upon the platform.

4,174,634
ECHOGRAPHIC DEVICE FOR THE REAL-TIME DISPLAY OF INTERNAL DISCONTINUITIES OF A TEST OBJECT

Jacques Dory, Meaux, France, assignor to C.G.R. Ultrasonic, Meaux, France

Filed Jan. 3, 1978, Ser. No. 866,709
Claims priority, application France, Jan. 4, 1977, 77 00082
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—606 20 Claims

1. An echographic device for displaying, in real time, internal discontinuities of a test object to be examined, comprising:
first electroacoustic transducer means juxtaposable with the test object;
a source of recurrent ultrasonic-frequency electrical signals connected to said first transducer means for exciting same to emit original ultrasonic wave trains into said test object and to reconvert reflections of said original wave trains from internal object points into electrical echo signals;
second electroacoustic transducer means electrically connected to said first transducer means for receiving said echo signals therefrom and converting same into regenerated ultrasonic wave trains;
a transluminable interaction medium in contact with said second transducer means for insonification thereby, said medium transmitting the regenerated wave trains in a predetermined general direction of travel;
acoustic focusing means in said medium for concentrating said regenerated wave trains onto image points spatially correlated with respective reflecting object points whereby schlieren differing in density from the surrounding medium are temporarily generated at said image points, said schlieren coming into existence in an image space of said medium with delays measured from the time of excitation of said first transducer means which are a function of the distances of said object points from said first transducer means and which establish an apparent schlieren speed in said direction of travel;

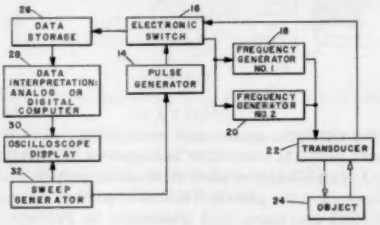


first optical means on one side of said medium generating a laminar light beam transluminating said image space, said beam having a narrow cross-section elongate in a direction substantially perpendicular to said direction of travel;
sweep means coupled with said first optical means and synchronized with said source for displacing said beam parallel to itself in said direction of travel over at least a part of said image space with a velocity substantially corresponding to said apparent schlieren speed and at times coinciding with the formation of schlieren in the region swept by the beam with resulting diffraction of light rays forming part of said beam; and
second optical means on a side of said medium opposite said one side for focusing the diffracted light rays upon a receiving surface to visualize said image points.

4,174,635
METHOD AND APPARATUS FOR ULTRA SOUND IMAGING UTILIZING RAYLEIGH BACKSCATTER

William H. Oldendorf, 2805 Angelo Dr., Los Angeles, Calif. 90024

Filed Jun. 1, 1978, Ser. No. 911,446
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—606 18 Claims



1. An ultrasonic imaging system comprising in combination:
ultrasonic generating means for generating at least a pair of pulses of slightly differing ultrasonic frequencies,
means for transmitting said ultrasonic waves to an object;

means for individually detecting both frequencies scattered from said object, and

means for differentially amplifying said scattered waves and displaying an image representative of the regional scattering cross-section of the interior of said object.

4,174,636

TWO WHEEL ULTRASONIC RAIL TESTING SYSTEM AND METHOD

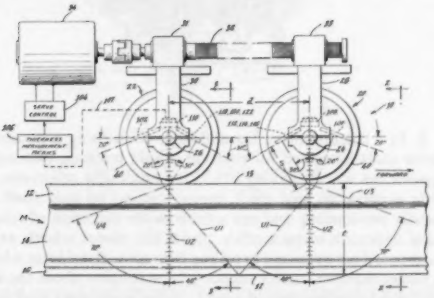
Dominick A. Pagano, 10 Sasqua Trail, Georgetown, Conn. 06829

Continuation-in-part of Ser. No. 818,544, Jul. 25, 1977. This application Aug. 1, 1977, Ser. No. 820,588

The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—636 **6 Claims**



1. In a system of the type for performing ultrasonic inspection of a length of test material, such as a rail, with ultrasonic transducing means emitting a beam of ultrasonic energy from within sealed wheel means containing a coupling liquid therein and having a flexible membrane transparent to the ultrasonic beam and arranged for rolling contact along the test material, rail inspection apparatus comprising:

leading wheel means arranged for rolling contact along the length of rail,

trailing wheel means spaced behind the leading wheel means and arranged for rolling contact along the length of rail,

first ultrasonic transducer means mounted in the leading wheel means aimed at an angle downwardly and rearwardly and second ultrasonic transducer means mounted in the trailing wheel means aimed at an angle downwardly and forwardly for transmitting ultrasonic energy from one of said transducer means to the other longitudinally through the rail at an angle to the top surface thereof,

third ultrasonic transducer means mounted in one of said wheel means aimed at an angle downwardly and laterally for transmitting ultrasonic energy in the rail in a side-looking direction substantially perpendicularly to the side surface of the rail and at a resultant angle of approximately 40° to the perpendicular to the top surface of the rail toward the lower gage corner of the rail head and for obtaining optimum reflection of ultrasonic energy from the lower gage corner, regardless of the various sizes of rail heads encountered, to detect loss of amplitude of the energy caused by impingement with a defect,

fourth ultrasonic transducer means mounted in the other wheel means aimed at an angle downwardly and laterally for transmitting ultrasonic energy in the rail in a side-looking direction substantially perpendicularly to the side surface of the rail and at a resultant angle of approximately 40° to the perpendicular to the top surface of the rail toward the lower field corner of the rail head and for obtaining optimum reflection of ultrasonic energy from the lower field corner, regardless of the various sizes of the rail heads encountered, to detect loss of amplitude of the energy caused by impingement with a defect, and

fifth ultrasonic transducer means in at least one of said wheel means aimed downwardly at a zero angle to the perpendicular to the top surface of the rail,

thereby effectively probing the rail for various kinds and orientations of defects regardless of whether the rail is welded or jointed.

4,174,637

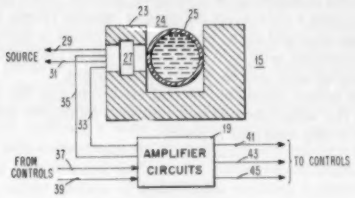
PRESSURE MONITORING SYSTEM

Alfred P. Mulzet, Endicott, and Gary A. Trudgen, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,766

Int. Cl.[2] G01L *7/02*

U.S. Cl. 73—730 **8 Claims**



1. A pressure monitoring system for determining the pressure of fluid in a section of flexible wall tubing comprising, in combination,

a supporting block having a channel therein in which a section of fluid filled tubing is inserted,

a pressure transducer mounted in said block, having a predetermined initial load imposed thereon by the fluid-filled tubing inserted in said block, and providing a first electrical signal having a value dependent upon the value of said initial load,

a reference signal source,

comparing means connected to said transducer and said reference signal source for comparing the signal from said transducer with the reference signal,

reference signal control means connected to said comparing means and said reference signal source for varying said reference signal in accordance with the variation in the output of said comparing means, and

indicating means for indicating variations in said reference signal.

4,174,638

PRESSURE PICKUP FOR MEASURING THE PRESSURE IN THE INTAKE MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

Erich Zabler, Karlsruhe; Walter Jansche, Durmersheim, and Frieder Heintz, Stutensee, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,641

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725543

Int. Cl.[2] G01L *9/10*

U.S. Cl. 73—728 **12 Claims**

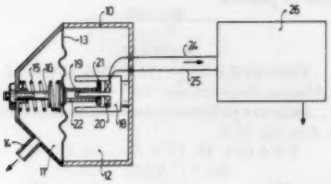
1. A pressure pickup for measuring the pressure in the intake manifold of an internal combustion engine, comprising:

a housing with a part separating said housing into a first chamber and a second chamber, said first chamber being in communication with said intake manifold and said part being movable in response to said pressure in said first chamber,

an electromagnet in said second chamber including a core

and at least one coil and generating magnetic flux lines in said,

means for short-circuiting the magnetic flux lines covering said central leg of said core and connected to said part for movement therewith slidably in said recess to thereby change the induction of said coil, and



said core comprising an E-shaped member with three legs including a central leg defining an annular recess, said coil being disposed in the bottom of said recess in surrounding relationship with said central leg and in underlying relationship with said short-circuiting means,

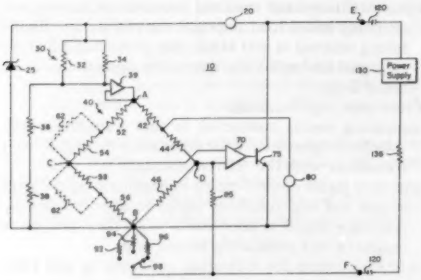
circuit means connected to said electromagnet for evaluating the inductance of said coil thus indirectly measuring the intake manifold pressure.

4,174,639

BRIDGE CIRCUITS

John Raven, Prospect, Conn., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Apr. 6, 1978, Ser. No. 893,937
Int. Cl.[2] G01B 7/18
U.S. Cl. 73—766 **20 Claims**



9. An electrical circuit comprising:

a bridge circuit comprising:

first and second electrical elements connected in series in a first arm of the bridge circuit between first and second input nodes, said first and second electrical elements having a resistance which varies as a function of at least two variables;

third and fourth electrical elements connected in series in a second arm of the bridge circuit between said first and second input nodes;

a regulated voltage supply having first and second terminals connected to said first and second input nodes of the bridge circuit;

means for producing an output signal from said bridge circuit, said means having first and second inputs, said first input being connected to a first output node of the bridge circuit between said first and second electrical elements and said said second input being connected to a second output node of said bridge circuit between said third and fourth electrical elements; and

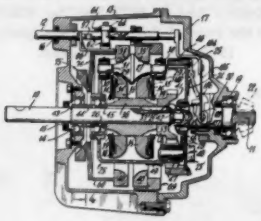
a constant current source connected between said first input node and a point in the second arm of the bridge circuit such that there is a non-zero resistance between said point and the first and second input nodes.

4,174,640

TRACTION-DRIVE TRANSMISSION

Thorn W. Dickinson, Berlin, Conn., assignor to Textron Inc., Providence, R.I.

Filed Sep. 9, 1977, Ser. No. 831,934
Int. Cl.[2] F16H 37/06
U.S. Cl. 74—690 **18 Claims**



1. In a traction-drive transmission, comprising a housing, a drive shaft journaled for rotation in said housing, two axially spaced sun wheels having keyed longitudinally relatively slidable support on said shaft, means carried by said shaft and axially pre-loading said sun wheels in the direction of relative axial approach to each other, plural like planet wheels axially interposed between and in rolling contact with said sun wheels, a planet-member carrier supported for rotation about the shaft axis and including spaced radial guides positioning said planet wheels on annularly spaced axes offset from the shaft axis and in said planet-member carrier, whereby each of said planet wheels may have at least a degree of generally radial freedom at its guided angular position with respect to said carrier, two axially movable reaction rings having anti-rotational support in said housing and in constant rolling contact with said planet wheels, an output shaft journaled for rotation in said housing, gear means differentially responsive to rotation of said impact shaft with respect to rotation of said planet-member carrier, and control means for varying the relative axial spacing of said reaction rings; the improvement in which the shaft support of said sun wheels includes diametrically aligned pivot means defining an axially fixed pivot axis through and normal to the input-shaft axis at a location intermediate said sun wheels, equalizer means having diametrically opposed radially projecting connection elements and including a central region connected to said input shaft by said pivot means, one radially projecting connecting element of said equalizer means having axially retaining connection to one to the exclusion of the other of said sun wheels, and the other radially projecting connecting element of said equalizer means having axially retaining connection to said other to the exclusion of said one of said sun wheels, whereby said pivot means provides a constant fixed reference for stabilizing like axial offsets of said sun wheels on opposite sides of the radial plane which includes the pivot axis.

4,174,641

POWER DRIVE TRANSMISSION ASSEMBLY

Darrel D. Hillman, Santa Ana, Calif., assignor to Electromatic Drive Corporation, Fort Worth, Tex.

Division of Ser. No. 629,090, Nov. 5, 1975, Pat. No. 4,088,036, which is a continuation-in-part of Ser. No. 525,450, Nov. 20, 1974, abandoned. This application Aug. 8, 1977, Ser. No. 822,516
Int. Cl.[2] F16H 55/52, 55/56
U.S. Cl. 74—230.17 A **5 Claims**

1. In combination with a prime mover having a driving shaft to which rotational power is transmitted by said prime mover, a power drive assembly operatively associated with said prime mover, said assembly comprising:

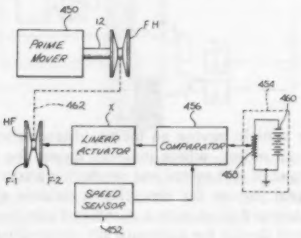
an endless V-belt;

a rotatably supported driven shaft spaced from said driving shaft and parallel thereto;

a driving pulley defined by first and second halves, said first half of said driving pulley rigidly secured to said driving shaft, and said second half of said driving pulley slidably mounted on said driving shaft and substantially nonrotatable relative thereto;

a driven pulley defined by first and second halves, with said first half being rigidly secured to said driven shaft, and said second half being slidably mounted on said driven shaft nonrotatable relative thereto;

force exerting means that tends to maintain said second half of said driving pulley in a position relative to said first half thereof such that the effective pitch diameter of said driving pulley is a maximum, said force exerting means comprising a compressed helical spring that encloses said second shaft, said spring having first and second ends, said first end being in a fixed position relative to said shaft and



said second end being in force exerting contact with said half of said second pulley;

spring means that tends to move said second half of said driven pulley to a predetermined maximum spacing relative to said first half thereof;

a first means operatively associated with said spring means for moving said second half of said driven pulley relative to said first half thereof when said first means is energized to vary the effective pitch diameter of said driven pulley;

a second means for sensing the rotational speed of said driven shaft and generating an output whose magnitude is related to the speed of rotation;

a reference level; and

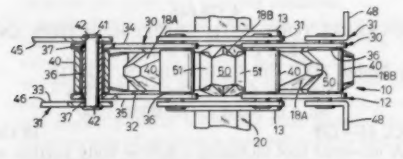
third means for comparing the difference in magnitude between said output of said second means and said reference level, and for generating an output to said first means to move said second half of said driven pulley relative to said first half to vary the effective pitch diameter of said driving and driven pulleys until said output of said second means and said reference level are equal.

4,174,642

CHAIN DRIVE INCLUDING SPROCKET HAVING ALTERNATE WIDE AND NARROW TEETH

Virgil B. Martin, West Bend, and Roger L. Villers, Waubeka, both of Wis., assignors to Gehl Company, West Bend, Wis.

Filed Feb. 9, 1978, Ser. No. 876,251
Int. Cl.[2] F16H *55/30;* **F16G** *13/02*
U.S. Cl. 74—243 R **2 Claims**



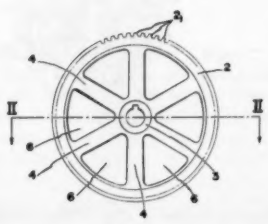
1. In a chain drive, in combination: a sprocket rotatable in a plane about an axis and a flexible chain having a portion engaged with said sprocket and an oncoming flight portion; said chain comprising interconnected links, each link comprising a pair of link plates spaced apart from each other by a predetermined distance in a direction along said axis to define a link opening, with the link plates in adjacent links being spaced apart different predetermined distances and with the plates in every other link being spaced apart the same predetermined distance to provide alternate wide and narrow link openings; said sprocket comprising a body portion having opposite sides of a periphery and having an even number of tapered teeth extending radially outward from said periphery relative to said axis in a plane normal to said axis, each tooth having a length measured in a direction transverse to said axis and having a width measured in a direction along said axis, with adjacent teeth being of different widths relative to each other and with every other tooth being of substantially the same width to provide wide and narrow teeth for engagement with said wide and narrow link openings, respectively, said teeth cooperating with the links in said oncoming flight portion to effect alignment of said chain with said sprocket, each opposite side of said body portion comprising a main surface and a plurality of stepped surfaces spaced apart from each other around the body near the periphery thereof, each side tooth having a side surface near the root thereof defined by a portion of said main surface for load-bearing engagement with the inside surface of a link plate defining a wide link opening, each narrow tooth having a side surface near the root thereof defined by a portion of one of said stepped surfaces for load-bearing engagement with the inside surface of a link plate defining a narrow link opening.

4,174,643

SILENT GEAR WHEEL

Kotaro Tsukamoto, 7-8, Kashima 4-chome, Yodogawa-ku, Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,682
Int. Cl.[2] F16H *55/14;* **F16F** *15/10*
U.S. Cl. 74—443 **1 Claim**



1. A gear wheel comprising a rim having a plurality of teeth around the periphery thereof, a hub within said rim, spokes connected between said rim and said hub, sound absorbing material filling the spaces between said spokes for silencing the noise caused by vibration of the gear wheel, and side plates attached to said rim, said hub and said spokes and completely covering the openings from the spaces between said spokes for confining the sound absorbing material in said spaces.

4,174,644

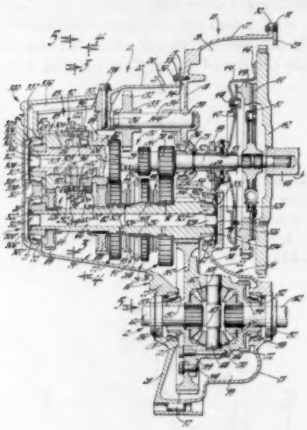
TRANSMISSION AND SHIFT LINKAGE

Laszlo Nagy, St. Clair Shores, and Donald J. Pulk, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,954
Int. Cl.[2] G05G *5/10, 9/18*
U.S. Cl. 74—477 **11 Claims**

1. In a control linkage for a multispeed transmission: a housing; gearing having first and second shift collars each selec-

tively axially movable from a central neutral position in opposite directions to one and another drive positions; a guide member mounted axially in said housing; first and second shift members respectively having first and second connector abutment portions and first and second fork portions directly connected to said first and second shift collars and each shift member being mounted on said guide member for independent axial shifting movement from a central neutral position in one direction to one drive position and in the opposite direction to another drive position; a shift shaft mounted transversely in said housing for selecting movement along its transverse axis between first and second select positions and for rotary shifting movement from a central neutral position in one direction to one drive position and in the opposite direction to another drive position; a shift lever radially mounted on said shift shaft for corresponding movement with said shift shaft to corresponding positions and selectively directly connected respectively to said first and second connector abutment portions of said first and second shift members operative, when in said central neutral position, by selecting movement of said shift shaft and said shift lever to one of said first and second select positions, to respectively selectively directly engage one of



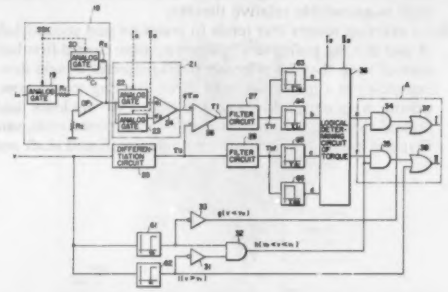
said first and second connector abutment portions and operative on shifting movement to correspondingly shift the selectively engaged one of said first and second connector abutment portions to respectively shift said first and second shift members from said central neutral position to said one and another drive positions; an interlock member mounted on said shift shaft for conjoint transverse axial movement and to permit rotation of said shift shaft relative to said interlock member and having first and second interlock cam portions located transversely on opposite sides of said shift lever operative, when said shift lever is in said first select position to permit free shifting movement of said first shift member and to position said second interlock cam portion to directly engage said second connector abutment portion to hold said second shift member in said central neutral position and when said shift lever is in said second select position to permit free shifting movement of said second shift member and to position said first interlock cam portion to directly engage said first connector abutment portion to hold said first shift member in said central neutral position, and guide means on said housing and interlock member to prevent rotary movement and permit transverse axial movement of said interlock member.

4,174,645

AUTOMATIC CHANGE-GEAR CONTROL DEVICE FOR USE IN ELECTROMOBILE

Tsutomu Ohmae, and Katsuji Marumoto, both of Hitachi, Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,657
Claims priority, application Japan, Nov. 29, 1975, 50-141836
Int. Cl.[2] B60K *41/04*
U.S. Cl. 74—866 **2 Claims**



1. In an vehicle having an inertia characteristic and being driven by an motor, which includes means for detecting an output torque of said motor and producing a correlated motor torque signal, means for detecting a vehicle speed of said electromobile and producing a correlated vehicle speed signal, and a control device for automatically controlling a gear position of a change gear device according to a gear-changing pattern having at least a small gear ratio and a large gear ratio, commensurate with the output torque and the vehicle speed thus detected, and means for detecting the selected gear and producing a correlated gear ratio signal; an automatic change gear control device, comprising:

means for obtaining a vehicle output torque signal from said motor torque signal and said gear ratio signal;

means differentiating said vehicle speed signal with respect to time for obtaining an acceleration torque signal from the variation in vehicle speed signal and the vehicle inertia characteristic;

operational means for obtaining a load torque signal from a difference between said vehicle torque signal and said acceleration torque signal;

means setting a fixed upper acceleration torque limit signal;

means setting a fixed lower acceleration torque signal;

means setting a fixed upper load torque limit signal;

means setting a fixed lower load torque limit signal;

means selecting the small gear ratio when said load torque signal and said acceleration torque signal are both below their lower limit signals;

means selecting the large gear ratio when either one of said load and acceleration torque signals is larger than its upper limit signal; and

means maintaining the selected gear ratio when said load torque signal and said acceleration torque signal are both below their upper limit signals, and when either one of said load and acceleration torque signals is larger than its lower limit signal.

4,174,646

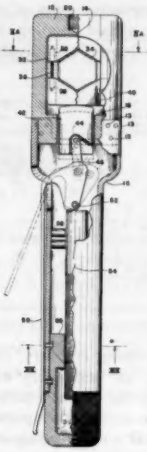
UNIVERSAL TOOL WITH GRIPPING ACTION AND REPLACEABLE JAWS

Simon Kotler, 222 E. 8th St., Brooklyn, N.Y. 11218

Filed May 8, 1978, Ser. No. 903,555
Int. Cl.[2] B25B *13/18*; B25G *1/00*
U.S. Cl. 81—128 **10 Claims**

1. A universal tool including a hollow body portion and a head portion; a cavity in said head; a passageway communicating from said cavity to said body; a cassette-type work element

removably mounted in said cavity; said element including spaced longitudinal guides enclosing fixed and slidable working surfaces connected by expansion springs; a pusher element



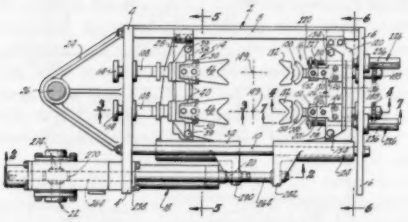
slidably mounted in said passageway in contact with said slidable working surface a clamp including a cam pivoted at one end to said pusher element; a screw unit in said hollow body said cam being eccentrically mounted on said screw unit.

4,174,647

APPARATUS FOR STRAIGHT LINE SHEARING

Francis A. Dahms, Tariffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 8, 1978, Ser. No. 876,086
Int. Cl.[2] C03B *5/38*
U.S. Cl. 83—58 **12 Claims**



1. An apparatus for use with a feeder for shearing gobs from a column of plastic material comprising:

(a) at least one set of oppositely disposed shear blades movable in a straight line toward and away from each other between open and shearing positions; and

(b) a pneumatic control system for operating said shear blades, said control system including:

(i) a source of fluid pressure;

(ii) pneumatic cylinder assembly means including a piston member and operating rod for driving said shear blades between said open and shearing positions;

(iii) means connecting said pneumatic cylinder assembly means to said source of fluid pressure including a first valve having first and second positions, said first position permitting fluid pressure to flow to one side of said piston to move said piston into the shearing position, said second position permitting fluid pressure flow to the other side of said piston member to move said piston member into the open position;

(iv) means connecting said source of fluid pressure to said first valve to cause the actuation thereof including a second valve having first and second positions, said first position permitting fluid pressure to flow to said first valve to actuate said first valve into its first position, said second position permitting fluid pressure flow to said first valve to actuate said first valve into its second position;

(v) means connecting said source of fluid pressure to said second valve to cause the actuation thereof into its first position and including a third valve having a normal position blocking fluid pressure flow and an actuated position permitting fluid pressure flow; and

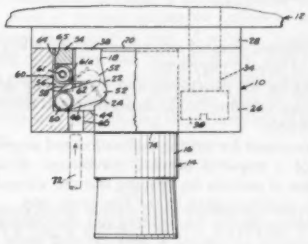
(vi) means driven by said operating rod to actuate said second valve into its second position after said shear blades have moved to their shearing position.

4,174,648

PUNCH RETAINER

Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48123

Continuation-in-part of Ser. No. 874,230, Feb. 1, 1978, abandoned. This application Oct. 16, 1978, Ser. No. 951,756
Int. Cl.[2] B26D *7/26*; B26F *1/14*
U.S. Cl. 83—698 **16 Claims**



1. In combination, a punch having a shank of circular cross section, said shank having a flat side wall portion extending lengthwise of the punch to the upper end thereof, said shank having a radially inwardly extending recess at the lower end of said flat side wall portion, a retainer having a vertically extending circular bore therein sized to receive said shank and abutment means against which the shank is adapted to bottom when the punch is inserted upwardly therein, said retainer also having a socket therein opening at one side thereof into said bore, a latch supported at one end thereof in said socket for pivotal movement about a horizontal axis spaced radially from said bore, the opposite end of said latch being adapted to engage said recess when the upper end of the punch shank is inserted axially into said bore to retain the punch therein, means biasing said latch to pivot downwardly and means in said socket limiting the pivotal movement of said latch in an upward direction to a position wherein the punch-engaging end of the latch just clears the flat side wall portion on the shank of the punch whereby the punch can be inserted into said bore to interengage the latch with the flat side wall portion of the shank only when the punch is oriented with the flat side wall portion aligned parallel with the pivot axis of said latch, the punch engaging end of said latch comprising a generally cylindrical surface extending parallel to the pivot axis of the latch, said recess including a generally flat latch-engaging surface extending downwardly and radially inwardly from the lower end of said flat side wall portion, said latch being inclined upwardly from its pivot axis with its punch-engaging end engaging said flat latch surface in a wedging relation when the punch bottoms against said abutment means.

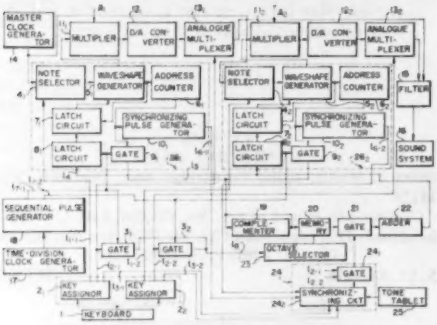
4,174,649
ELECTRONIC MUSICAL INSTRUMENT

Nobuharu Obayashi, Kami; Hikaru Hashizume, Hamamatsu; Noriji Sakashita, Hamamatsu; Seiji Kameyama, Hamamatsu; Sadaaki Ezawa, Hamamatsu; Hironori Watanabe, Hamamatsu; Tatsunori Kondo, Hamamatsu; Toshio Kugisawa, Hamamatsu, and Yutaka Washiyama, Fujieda, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Oct. 17, 1977, Ser. No. 842,523

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.01 **2 Claims**



1. An electronic musical instrument having a keyboard with a plurality of keys, comprising:

a key assignor for generating and temporarily storing a key code corresponding to the depression and release of a key, respectively,

a memory circuit for storing inclination and amplitude variations of a required musical waveshape divided into a plurality of periods for reading out the waveshape information corresponding to the key code; and

a tone source device for reading out the information from the memory circuit on a time divided basis to thereby simultaneously obtain waveshapes of different frequencies with the frequencies based on the time division;

wherein the tone source device divides the key code from the key assignor into a plurality of time divided channels and includes waveshape generators of different sound ranges in each of the channels, and wherein there is provided means for reading out the waveshape information from the memory circuit corresponding to the divided information, respectively.

4,174,650
ENVELOPE GENERATOR FOR AN ELECTRONICS MUSICAL INSTRUMENT

Teruo Hiyoshi; Akira Nakada; Shigeru Yamada, all of Hamamatsu; Kiyoshi Ichikawa, Hamakita, and Shigeki Ishii, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 678,709, Apr. 20, 1976, Pat. No. 4,082,027. This application Nov. 11, 1977, Ser. No. 850,649

Claims priority, application Japan, Apr. 23, 1975, 50/49525; Apr. 25, 1975, 50/50559; Apr. 26, 1975, 50/51247

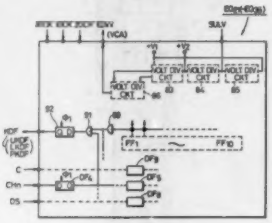
Int. Cl.[2] G10H *1/00, 3/00, 1/02*

U.S. Cl. 84—1.01 **12 Claims**

1. For use in an electronic musical instrument, an envelope waveshape generator for generating a control voltage representing an envelope waveshape having a plurality of different waveshape sections each having selectable beginning and end voltage levels, the control voltage variation as a function of time for each such waveshape section being independently selectable, comprising:

a like plurality of voltage dividing circuits each corresponding to a respective one of said waveshape sections and each having a plurality of voltage division points between two input terminals where the selected beginning and end voltage levels for that section are respectively applied,

a sampling circuit for sequentially obtaining divided voltage outputs from consecutive pairs of said voltage division points, first in one of said dividing circuits and thereafter consecutively in others of said dividing circuits, and



waveshape section timing circuitry, cooperating with said sampling circuit, for separately establishing for each waveshape section the rate at which said voltage outputs are obtained from consecutive pairs of voltage division points, said control voltage being derived from said obtained voltage outputs.

4,174,651
KEYBOARD TYPE ELECTRONIC MUSICAL INSTRUMENT

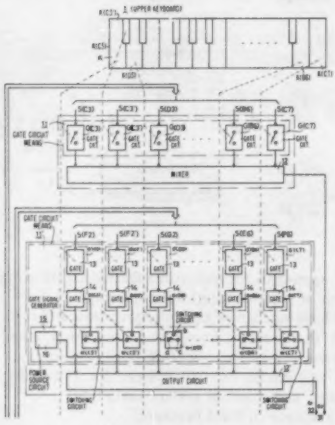
Ikutaro Kakehashi, Osaka, Japan, assignor to Roland Corporation, Osaka, Japan

Filed Oct. 31, 1977, Ser. No. 847,146

Claims priority, application Japan, Oct. 29, 1976, 51-146515[U]

Int. Cl.[2] G10H *3/00*

U.S. Cl. 84—1.11 **1 Claim**



1. A keyboard type electronic musical instrument comprising:

a keyboard having an arrangement of keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . corresponding to an arrangement of letter names . . . H_{-2}, H_{-1}, H_0, H_{+1}, H_{+2}, . . . , where H_0 is one of letter names . . . A_{n+1}#, B_{n-1}, C_n, C_n#, D_n, D_n#, E_n, F_n, F_n#, G_n, G_n#, A_n, A_n#, B_n, C_{n+1}, C_{n+1}#, D_{n+1}, . . . based on the scale of the equal temperament of 12 degrees (n being an integer), H_{+1}, H_{+2}, . . . are letter names defined for frequencies higher than that for the letter name H_0 and sequentially arranged in an increasing

order of frequency and H_{-1}, H_{-2}, . . . are letter names defined for frequencies lower than that for the letter name H_0 and sequentially arranged in a decreasing order of frequency;

a sound signal generator for generating sound signals . . . S_{-2}, S_{-1}, S_0, S_{+1}, S_{+2}, . . . having frequencies F_{-2}, f_{-1}, f_0, f_{+1}, f_{+2}, . . . defined for the letter names . . . H_{-2}, H_{-1}, H_0, H_{+1}, H_{+2}, . . . , respectively;

first gate circuit means including gate circuits . . . G_{-2}, G_{-1}, G_0, G_{+1}, G_{+2}, . . . respectively corresponding to the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard;

a first mixer for mixing the outputs from the gate circuits . . . G_{-2}, G_{-1}, G_0, G_{+1}, G_{+2}, . . . of the first gate circuit means;

second gate circuit means including gate circuits . . . G'_{-2}, G'_{-1}, G'_0, G'_{+1}, G'_{+2}, . . . respectively corresponding to the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard;

a frequency multiplier for frequency multiplying the outputs from the gate circuits . . . G'_{-2}, G'_{-1}, G'_0, G'_{+1}, G'_{+2}, . . . of the second gate circuit means;

a second mixer for mixing the outputs from the first mixer and the frequency multiplier;

wherein the gate circuits . . . G_{-2}, G_{-1}, G_0, G_{+1}, G_{+2}, . . . of the first gate circuit means are respectively supplied with the sound signals . . . S_{-2}, S_{-1}, S_0, S_{+1}, S_{+2}, . . . from the sound signal generator and are controlled to pass therethrough the sound signals . . . S_{-2}, S_{-1}, S_0, S_{+1}, S_{+2}, . . . upon depression of the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard;

wherein the gate circuits . . . G'_{-2}, G'_{-1}, G'_0, G'_{+1}, G'_{+2}, . . . of the second gate circuit means are respectively supplied with sound signals . . . S_{-2+p}, S_{-1+p}, S_{O+p}, S_{+1+p}, S_{+2+p}, . . . (p being a positive or negative integer larger than unity) and are controlled so that when Q (an integer larger than unity) selected ones of the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard are simultaneously depressed (the selected keys being identified generally as K'_1, K'_2, . . . K'_Q, the keys corresponding to the letter means of the highest and lowest frequencies among the keys K'_1, K'_2, . . . K'_Q being identified generally as K_H' and K_L', respectively, the gate circuits corresponding to the keys K_H' and K_L' being identified generally as G_H' and G_L', respectively, and the sound signals supplied to the gate circuits G_H' and G_L' being identified generally as S_{H+P} and S_{L+P}, respectively), the gate circuit G_H' or G_L' passes therethrough the sound signal S_{H+P} or S_{L+P} upon depression of the key K_H' or K_L'; and

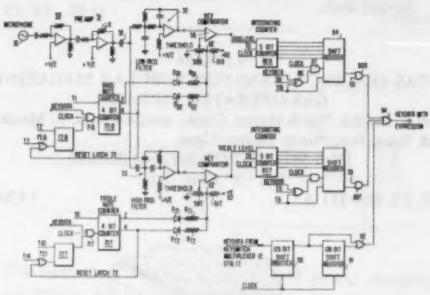
wherein the frequency multiplier has a frequency multiplying ratio of the value of the ratio between a frequency defined for the letter name based on the natural scale corresponding to the letter name based on the scale of the equal temperament of 12 degrees to which a sound signal S_M corresponds, and a frequency defined for the letter name based on the natural scale corresponding to the letter name based on the scale of the equal temperament of 12 degrees to which a sound signal S_M' corresponds, the sound signal S_M being supplied to the gate circuit of the first gate circuit means corresponding to a selected one (identified as K_M) of the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard and corresponding to the letter name based on the scale of the equal temperament of 12 degrees corresponding to the letter name based on the natural scale, and the sound signal S_M' being supplied to the gate circuit of the second gate circuit means corresponding to the key K_M.

4,174,652

METHOD AND APPARATUS FOR RECORDING DIGITAL SIGNALS FOR ACTUATING SOLENOID

Joseph M. Campbell, Lewisburg, Tenn., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Aug. 26, 1977, Ser. No. 828,069
Int. Cl.[2] G10H 3/04
U.S. Cl. 84—1.28 **6 Claims**



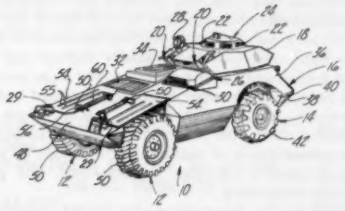
1. In an electronic player piano system having musical key note actuations recorded in a time division multiplex frame format, wherein the improvement for eliminating the choppiness and mechanical sounding in the playing of said musical key note actuations to re-create a musical performance, comprising the steps of storing successive frames of musical key note actuations in at least a pair of serially connected shift registers, and combining the outputs of said shift registers to repeat each preceding time division multiplex frame of data at lease one further time for recording and/or playback to thereby stretch said notes during the re-creation of said musical performance.

4,174,653

ARMORED WHEELED VEHICLE WITH DISPLACEABLE WHEEL WELL FAIRING PANELS

Irving Appelblatt, West Bloomfield, Mich., assignor to Cadillac Cage Company, Warren, Mich.

Filed Oct. 14, 1977, Ser. No. 842,216
Int. Cl.[2] F41H 7/02
U.S. Cl. 89—36 H **6 Claims**



1. A wheeled armored vehicle including:

an armored hull having an obliquely extending frontal deck structure of ballistic impact resisting material;

a plurality of wheels supporting said armored hull including two front wheel assemblies disposed on either side of said frontal deck;

a suspension system allowing relative travel of said wheel assemblies with respect to said armored hull;

an enclosure arrangement for said front wheels comprising recesses extending into said vehicle hull and onto the surface defined by said frontal deck, said suspension normally disposing said front wheels in said recess below the level of said frontal deck;

fairing panels overlaying said open recess and generally conforming to the shape of said frontal deck;

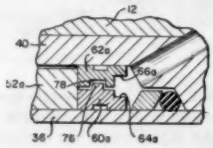
and means mounting said fairing panel to said hull allowing relative displacement therebetween so as to accommodate front wheel travel in said recesses above the level of said frontal deck whereby contours of said frontal deck are uninterrupted with structure enclosing said wheel wells extending above the level of said frontal deck while accommodating said wheel travel above the level of said frontal deck.

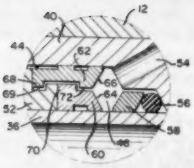
4,174,654

GAS-SEALING MEANS FOR TUBULAR MAGAZINE GAS-OPERATED FIREARM

Carl F. Liedke, North Haven, Conn., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.

Filed May 25, 1977, Ser. No. 800,190
Int. Cl.[2] F41C *5/02*
U.S. Cl. 89—191 A **4 Claims**





1. In a gas-operated autoloading firearm having a receiver, a barrel, a tubular magazine mounted beneath and parallel to said barrel, a gas cylinder fixed to said barrel and surrounding a portion of said magazine, said cylinder and magazine defining an annular gas-chamber closed at the end nearest the muzzle of the barrel, an annular member slidably mounted on said magazine for reciprocal movement axially thereof and normally disposed within said annular chamber, and a gas port connecting said barrel and chamber adjacent the closed end thereof,

a gas-sealing device for preventing leakage of gas from said chamber during the power-stroke of said annular member on pressurization of said annular chamber by gas in said barrel when a cartridge is discharged, said gas-sealing device comprising

a radially flexible inner piston-ring slidably mounted on said magazine forward of said annular member for sealing engagement with said magazine and having a gas-impingement surface facing said chamber,

a radially flexible outer piston-ring disposed radially outward of said inner piston-ring for sealing engagement with the inner walls of said cylinder and having a gas-impingement surface facing said chamber,

said gas-impingement surfaces on said inner and outer piston-rings facing outwardly and inwardly, respectively, relative to each other such that the pressure of the gas in said annular chamber acting directly on said gas-impingement surfaces flexes said inner piston-ring into sealing engagement with said magazine while flexing said outer piston-ring into sealing engagement with said cylinder,

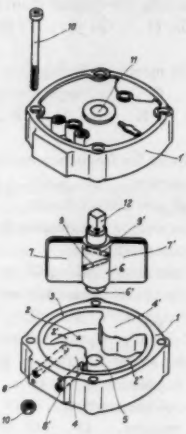
one of said piston-rings being connected to said annular member and to the other of said piston-rings such that said piston-rings move continuously with said annular member throughout its reciprocal movement.

4,174,655

PNEUMATIC APPARATUS FOR THE ROTATION OF VALVE RODS

Domenico Valente, Via Porto Corsini 10, 20126 Milan, Italy

Filed Jul. 27, 1977, Ser. No. 819,423
Claims priority, application Italy, Aug. 27, 1976, 26614 A/76
Int. Cl.[2] F01C *9/00*; F16J *11/04*
U.S. Cl. 92—122 **2 Claims**



1. A pneumatic rotary actuator for operation of a valve, comprising:

(i) a first casing having a side wall with a cylindrical internal face, and having an end wall with a central hole;

(ii) a resilient annular sealing gasket disposed within and secured to the side wall of the casing, said gasket having two diametrically opposed internal expansions so as to define, within said casing, a cavity having an approximately 8-shaped configuration including two half-chambers, said casing side wall including two inlet and outlet ports each opening into a respective one of said half-chambers;

(iii) a pin having one end journalled in said central hole of the casing end wall and carrying two radial blades lying in the same plane, and the vertical edges of which blades are in contact with said sealing gasket, said blades dividing each half-chamber into two sectors, said pin having two through-holes disposed on different horizontal parallel planes and oriented so as to provide communication between two opposite sectors of the half-chambers, and

(iv) a second casing secured to said first casing and having a central through-hole in which the protruding other end of said pin is journalled.

4,174,656

VALVE ACTUATOR

Donn W. Duffey, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 663,787, Mar. 4, 1976, abandoned. This application Jul. 14, 1977, Ser. No. 815,473
Int. Cl.[2] F01B *31/00*; F16J *15/16*
U.S. Cl. 92—134 **6 Claims**

1. A valve actuator comprising:

a hydraulic cylinder having a first and a second end, a central axis and a cylinderical inner surface with a uniform

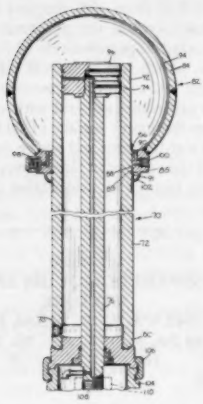
diameter along a length of said axis between said first and said second ends;

piston means slidably mounted within said cylinder for axial movement along said length between said first end and said second end of said cylinder, said piston means having a first side and a second side which extend across said diameter for sealed, sliding contact with said inner surface of said cylinder along said length;

an actuator rod joined at said first side of said piston means, extending through an opening in said first end of said cylinder for sealed, sliding movement therethrough and terminating at an extended end thereof which is outwardly of said cylinder;

said first end of said cylinder being secured to a valve housing and said extended end of said rod being secured to a valve stem;

a high pressure gas accumulator mounted on said cylinder, said accumulator having a generally spherical shaped pressure wall which is intersected by said cylinder to locate said second end of said cylinder within said accumulator, said second end having a passage therethrough to



allow communication of an interior of said accumulator with said second side of said piston means;

said generally spherical shaped pressure wall including an upper section thereof which is hemispherical, centrally located on said axis and located relative to said cylinder such that an interior surface of said section lies within a spherically shaped surface which if continued would extend through said cylinder to locate said second end of said cylinder totally within said spherically shaped surface and to also locate said second side of said piston means within said spherically shaped surface when said piston means is axially located along said length toward said second end of said cylinder; and

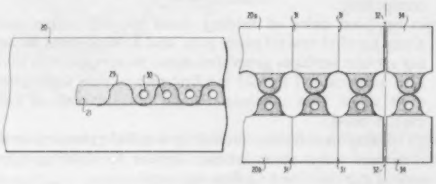
an access hole through said first end of said cylinder for supplying hydraulic fluid to said cylinder to act on said first side of said piston means to cause movement thereof toward said second end of said cylinder in opposition to a predetermined quantity of high pressure gas on said accumulator and for discharging said fluid to allow said predetermined quantity of high pressure gas to act on said second side of said piston means to cause movement thereof toward said first end of said cylinder.

4,174,657

METHOD OF FORMING A PLASTIC SHOPPING BAG HAVING A REINFORCED HANDLE

Heikki S. Suominen, Petsamonk 14, Tampere, Finland

Division of Ser. No. 856,871, Dec. 2, 1977, Pat. No. 4,125,220.
This application Jun. 29, 1978, Ser. No. 920,613
Claims priority, application Finland, Dec. 3, 1976, 763481
Int. Cl.[2] B31B *1/14, 1/86*
U.S. Cl. 93—35 H **5 Claims**



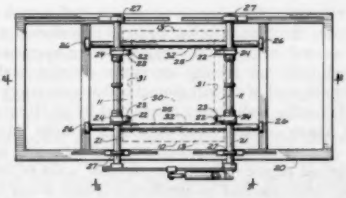
1. The method of forming a plurality of plastic shopping bags comprising the steps of providing an elongated tube of plastic film material having a flattened configuration which defines a pair of elongated tube faces that are disposed closely adjacent to one another and each of which faces includes an elongated strip of plastic material that is of heavier gauge than the remainder of said faces, said strips of heavier gauge material being positioned in coextensive overlapping relation to one another in the direction of elongation of said tube at locations on said tube faces substantially equidistant from the edges of said tube faces, the width of each of said strips between said edges being substantially less than the width of its associated tube face, cutting through said adjacent tube faces along a cutting line which has a cyclically recurring wave configuration extending in the direction of elongation of said tube faces and along said coextensive overlapping strips of heavier gauge material, the wavelength of said wave configuration being substantially equal to the desired width of one of said shopping bags at the mouth of said shopping bag, the amplitude of said cutting line wave configuration being greater than the widths of said heavier gauge strips whereby spaced crests of said wave configuration cut through the film material of said tube faces at positions outside of said heavier gauge strips, seaming the tube faces at a plurality of locations which extend respectively between said spaced crests and the outer edges of said flattened tube of plastic film material to provide a plurality of transverse seam lines, and thereafter cutting said tube faces along said plurality of transverse seam lines.

4,174,658

TRAY FORMER

Robert H. Graham, Spokane, Wash., assignor to R. A. Pearson Company, Spokane, Wash.

Filed Feb. 6, 1978, Ser. No. 875,230
Int. Cl.[2] B31B *3/26*
U.S. Cl. 93—51 HW **4 Claims**



1. In a carton forming machine for carton blanks having:

a central bottom wall bounded by first and second pairs of scored side walls each adapted to be folded perpendicular to the bottom wall;

said first pair of side walls having first scored tabs formed at each end thereof, said first tabs being adapted to be folded perpendicular to the side walls on which they are formed for engagement by the folded second pair of side walls;

said second pair of side walls having second scored tabs formed at each end thereof, said second tabs being adapted to be folded perpendicular to the side walls on which they are formed for engagement by the folded first pair of side walls;

a folding machanism complementary to a reciprocating mandrel conforming to the interior of a formed carton, comprising:

two opposed pairs of folding irons located respectively along parallel spaced pivot axes, said folding irons including arcuate surfaces generated about their respective pivot axes and adapted to told the first pair of side walls along their score lines common to the bottom wall of each carton blank;

each folding iron further including a radial extension at the outermost edge of its arcuate surface for folding a first scored tab relative to a first side wall;

means supporting the folding irons for pivotal motion about said parallel spaced pivot axes;

the spacing between the spaced pivot axes being greater than the combined lengths of one second side wall and the second scored tabs extending therefrom;

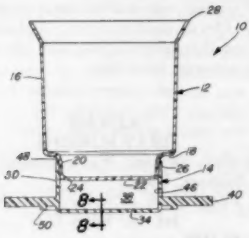
a pair of pressure rollers at an elevation below that of the folding irons, said rollers being journalled about parallel spaced roller axes which are perpendicular to the parallel spaced pivot axes, said rollers spanning the full distance separating the pivot axes and having a minimum separation between them substantially equal to the width dimension of the first carton walls between the second side walls, whereby the second side walls are folded along their score lines common to the bottom wall as each carton blank is forced between the rollers by reciprocation of the mandrel.

4,174,659

COFFEE BREWER

John P. Pugliese, Troy, and Thomas J. Robbins, Warren, both of Mich., assignors to Econo-Brew, Inc., Mt. Clemens, Mich.

Filed Nov. 14, 1977, Ser. No. 851,142
Int. Cl.[2] A47J *31/10*
U.S. Cl. 99—306 1 Claim



1. A one-cup coffee brewer consisting of a two-member construction, the first member being a cup-shaped reservoir and the second being a cup-shaped coffee receptacle, said cup-shaped reservoir having an upper circular wall and a lower circular wall of a lesser diameter than said upper circular wall, said circular walls being connected by an integral shoulder, said lower circular wall having a bottom including a plurality of apertures of a predetermined size, said apertures being disposed adjacent the lower circular walls of said reservoir at 90° intervals, and an aperture disposed at the center of said bottom wall, said lower circular wall having an inward taper extending from said shoulder toward said bottom wall to define a socket engaging surface, said reservoir being sized to hold a quantity of water sufficient to fill a cup of maximum desired size; the upper edge of said reservoir having an outwardly flared section which increases the inner diameter of the upper portion of said reservoir and which permits the user to grasp the same to permit removal of said reservoir from said receptacle, said flared end further functioning to limit the splashing of water from the interior of said reservoir during initial pouring of water therein;

said cup-shaped coffee receptacle having a circular wall defining a cavity and a bottom wall with a plurality of fine slits disposed in a transverse fashion on said bottom wall at laterally spaced, parallel locations, said slits defining apertures communicating with said cavity, the coffee receptacle cavity being sized to receive a charge of ground coffee sufficient to make one cup of brewed coffee of maximum desired strength, the inner surface of the circular wall of said receptacle having a taper adapted to snugly interfere with said reservoir tapered lower circular wall when the same is telescopically received within said receptacle cavity so as to securely and releasably attach said reservoir to said receptacle, said receptacle circular wall having an outer diameter less than the outer diameter of said reservoir upper circular wall, said receptacle having an integral, annular support flange projecting radially from the lower end of said receptacle circular wall, said support flange having a diameter greater than the maximum sized cup upon which the coffee brewer is to be supported;

the apertures in said reservoir being sized to permit a metered rate of flow from said reservoir to said cavity within said receptacle, while the apertures in said receptacle bottom are sized to permit a rate of flow from said receptacle cavity, which rate of flow is the same as the rate of flow through said reservoir apertures; and

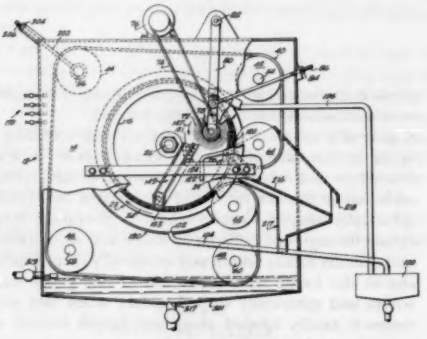
a circular rim projection integral with and extending downwardly from the lower surface of said support flange and radially outwardly from and above said reservoir bottom wall to limit the amount of lateral movement of said coffee brewer with respect to said coffee cup supporting said brewer.

4,174,660

DEVICE TO SEPARATE LIQUIDS AND SOLIDS IN A MIXTURE

Cerso R. Cuza, 2940 NW. 22 St., Miami, Fla. 33142

Filed Jul. 31, 1978, Ser. No. 929,514
Int. Cl.[2] A23N *1/00*
U.S. Cl. 99—495 12 Claims



1. A device to separate solids from juice in a mixture of juices and solids and a collector for the juice, said device comprising a frame, an annular centrifugal drum journaled on the frame, said drum having an annular peripheral perforated surface spanned by spaced faces, one of said faces having a charge opening, shield means arranged about the drum in spaced relation therefrom, a drive belt in driving engagement about the drum, said belt having holes by reason of which, when the drum is rotated, juice is extracted from the mixture

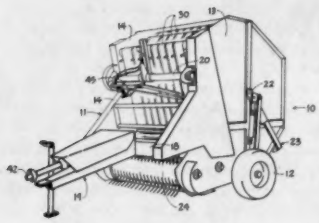
by centrifugal force and flows radially outwardly through the drive belt holes and drum, said shield means comprising guide means to guide the flow of juice, said machine including drive means for the drum belt, and said device including a first collector means to collect the juice from the shield and a second collector means having a first end zone within the drum and a second end zone outside of said drum and said second collector means extending through said charge opening and adapted for discharging solids from the machine.

4,174,661

AUTOMATIC ROUND BALE TWINE WRAPPING ASSEMBLY

Arnold Mathes, Pella; Norman D. Person, Knoxville, and Stanley J. Vermeer, Pella, all of Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa

Filed Sep. 18, 1978, Ser. No. 943,530
Int. Cl.[2] B65B *13/02*
U.S. Cl. 100—5 **7 Claims**



1. In a machine for forming a round bale of a windrowed material having a mobile frame, a supply of wrapping twine having a free end portion, bale forming means on said frame operative to continue rotating a completed bale while said wrapping twine is wound thereon, and a pickup mechanism for supplying said material to said bale forming means, the improvement of an automatic bale wrapping assembly comprising:

(a) means for selectively initiating the winding of the wrapping twine about a completed bale,

(b) a linearly extendible and retractable elongated wrapping twine dispensing arm having a pair of sections longitudinally movable relative to each other, with said wrapping twine free end portion extendible from one of said sections,

(c) means on said frame movably supporting said dispensing arm on said frame for pivotal movement between an initial bale wrapping position and a final twine cutting position, and

(d) coacting means interconnected with said frame and dispensing arm for relatively moving said pair of sections during pivotal movement of the dispensing arm so that the dispensing arm is in a retracted condition in said initial bale wrapping position and in an extended condition in said final twine cutting position whereby a greater length of said twine free end portion is exposed in the retracted condition than is exposed in said extended condition.

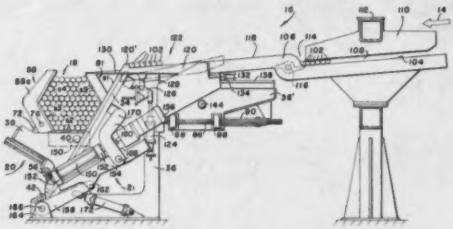
4,174,662

HEXAGONAL BUNDLE FORMING APPARATUS

Kenneth L. Klusmier, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed May 22, 1978, Ser. No. 907,482
Int. Cl.[2] B65B *13/00*
U.S. Cl. 100—7 **10 Claims**

1. An apparatus for forming elongated elements into a hexagonal bundle, comprising: an assembly zone defined by a plurality of support surfaces, one of which is stationary and the remainder of which are movable; delivery means for depositing successive tiers of elongated elements one upon the other in said assembly zone; operating means for adjusting said movable support surfaces in order to gradually impart a hexagonal cross section to the elongated elements accumulating in said



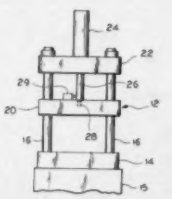
assembly zone; and means for tieing a completed assemblage of elongated elements in said assembly zone into a bundle which substantially retains said hexagonal cross section following removal of the bundle from said assembly zone.

4,174,663

SAFETY SYSTEM FOR HYDRAULIC VERTICAL PRESS

Roy K. Williams, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,371
Int. Cl.[2] F16P *7/00;* **B30B** *1/08*
U.S. Cl. 100—53 **6 Claims**



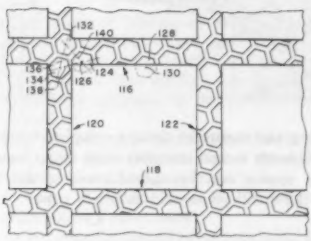
1. A hydraulic control system for a vertical hydraulic press adapted for heavy duty use, in which said press includes a fixed platen and a moving platen, said moving platen being engaged by a drive member for upward movement in opening the press and for downward movement for molding processes within said press, said control system including at least one hydraulic cylinder with piston reciprocal therein, said cylinder imposed within a hydraulic network for enabling the downward movement of said piston in said cylinder and consequent downward movement of said moving platen, said cylinder being adapted to be connected to said fixed platen and the piston thereof being adapted to be connected to the moving platen, a switch mechanism for detecting the continued engagement of said moving platen to said drive member, said switch mechanism responsive to the detection of a failure of said engagement for operating said hydraulic network to a condition preventing movement of said piston in said hydraulic cylinder thereby preventing downward movement of said platen.

4,174,664

CYLINDRICAL SCREEN HAVING APERATURES WITH GEOMETRIC CENTERS DEFINED BY ARRAYS OF EQUILATERAL TRIANGLES

Robert C. Arnott, and Charles E. Willbanks, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed May 8, 1978, Ser. No. 904,110
Int. Cl.[2] B05C *17/08*
U.S. Cl. 101—127 1 Claim



1. A screen for printing comprising

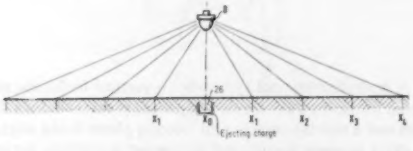
a hollow substantially cylindrical body having a plurality of apertures formed therein, the geometric centers of adjacent apertures defining a plurality of equilateral triangles, the angle between one side of each said equilateral triangle and circumferential lines on said cylindrical body being substantially 15°, the angle between another side and longitudinal lines on said cylindrical body being substantially 15° and the angle between the third side and both circumferential and longitudinal lines being substantially 45°.

4,174,665

LAND MINE CONSTRUCTION PARTICULARLY AN ANTIPERSONNEL SPLINTER MINE

Paul Madlener, Karlsruhe, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,757
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2623163
Int. Cl.[2] F42B *23/16*
U.S. Cl. 102—8 11 Claims



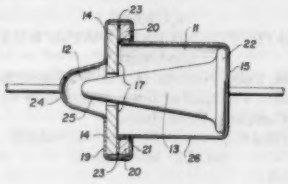
1. A land mine comprising a mine body having at least a ground facing portion with a casing formed of a surface of revolution, said surface of revolution having a multiplicity of projectile splinter forming means arranged in a plurality of enveloping tangent portions, the normals of each tangent portion pointing each splinter forming means to a definite target area to be covered, and an explosive in said casing effective upon explosion to catapult the multiplicity of splinter forming means downwardly in a substantially conical distribution, each at a predetermined angle depending on the mass of said splinter to the mass of said explosive and depending on the angle of impact of the detonation front of the explosion of the individual splinter.

4,174,666

SPRINGLESS IMPACT SWITCH

George K. Lucey, Jr., Greenbelt, Md., and Michael G. Orrell, San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 1, 1978, Ser. No. 901,885
Int. Cl.[2] F42C *19/06*
U.S. Cl. 102—216 6 Claims



1. A springless impact switch comprising:

a housing including a first and a second conductive section co-axial along a first axis and being electrically insulated from each other;

a co-axial movable contact element in conductive engagement with the first housing section and normally spaced from said second housing sections;

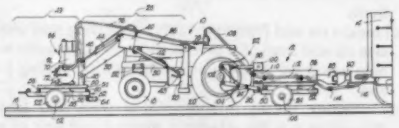
and an insulator disc interior said housing, concentric to said movable contact element and having a reduced inside diameter opening and radial slots defining fingers of the insulator, said fingers being deflectable by forces parallel to said axis to permit the contact element to establish electrical conductivity between said first housing section and said second housing section.

4,174,667

RAIL DRAFT VEHICLE EMPLOYING TRACTOR-LIKE APPARATUS

Charles E. Chenoweth, 3606 N. 30th Ter., Topeka, Kans. 66614

Continuation-in-part of Ser. No. 726,987, Sep. 27, 1976, Pat. No. 4,086,856. This application Nov. 30, 1977, Ser. No. 856,001
The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.
Int. Cl.[2] B60F *1/04*
U.S. Cl. 105—26 R 3 Claims



1. A rail draft vehicle assembly adapted both for travel along conventional railway-type rails to move a number of railroad cars of the kind having a conventional railway-type mechanical coupling mechanism at each end thereof and for travel along the ground between positions of desired operation of said assembly for moving railroad cars upon said rails, said assembly comprising:

a conventional tractor having steerable front wheel means and a pair of rear driving wheels for ordinarily supporting and propelling said tractor for travel along the ground, said tractor being provided with power operated, elevationally swingable, mechanical coupling means on the rear thereof;

a conventional tractor-type, power operated, elevationally swingable, boom apparatus on said tractor and extending forwardly therefrom, said boom apparatus being provided with mechanical coupling means on the forward extremity thereof;

a forward wheeled unit including frame structure and a first pair of rail wheels rotatably mounted on said frame structure and arranged for engaging said rails, said forward wheeled unit being provided with mechanical coupling means on said frame structure, cooperable with said coupling means on said boom apparatus and coupled with the latter for cantilever mounting said forward wheeled unit on said boom apparatus;

an intermediate vehicle unit adapted to be disposed between the rear of said tractor and one of said railroad cars for intercoupling the former with the latter,

said intermediate vehicle unit including frame means and a second pair of rail wheels rotatably mounted on said frame means and arranged for engaging said rails, said intermediate vehicle unit being provided with mechanical coupling means on the front of said frame means, cooperable with said coupling means on the rear of said tractor and coupled with the latter for cantilever mounting said intermediate vehicle unit on said tractor, and with conventional railway-type mechanical coupling means on the rear of said frame means, cooperable with said conventional railway-type mechanical coupling means on the said one railroad car and adapted for coupling with the latter,

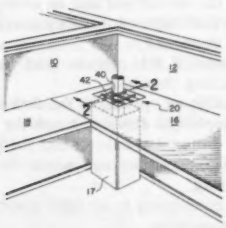
said first and second pairs of rail wheels being movable into engagement with said rails for guiding said draft vehicle assembly along said rails responsive to lowering of said boom apparatus and said coupling means on the rear of said tractor and movable out of engagement with said rails and the ground for permitting off-rail operation of said draft vehicle assembly responsive to raising of said boom apparatus and said coupling means on the rear of said tractor.

4,174,668

GRATING OPENING IN A WORKING TABLE FOR VERTICAL STORAGE

Donald K. Thomas, Jr., 1710 Laurel St., South Pasadena, Calif. 91030

Filed Aug. 7, 1978, Ser. No. 931,761
Int. Cl.[2] A47B *3/06*
U.S. Cl. 108—25 **7 Claims**



1. A working table having a grating for vertical storage of material in elongated form, comprising:

a working table having a vertically directed opening therethrough,

at least one vertical edge portion forming the surface of said opening,

a plurality of first opposite aligned pairs of horizontal holes in said vertical edge, and

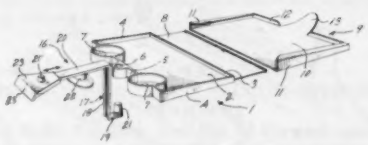
at least one rod extending across said opening and having one end in one of a pair of selected aligned holes and having its other end in the other of said pair of holes.

4,174,669

VEHICLE TRAY AND MOUNTING BRACKET ASSEMBLY

A. Roger Lalonde, Box 577, Chelmesford, Ontario, Canada (P0M 1L0)

Filed Feb. 22, 1978, Ser. No. 880,041
Int. Cl.[2] A47B *23/00*
U.S. Cl. 108—44 **4 Claims**



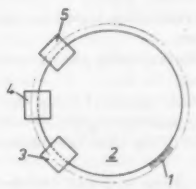
1. A vehicle tray and mounting bracket assembly comprising, in combination, a mounting bracket of L-shape configuration including a horizontally extending arm forming an elongated base securable onto the floor of a vehicle and having in the top face a groove extending longitudinally of said base, and a vertically extending arm pivoted to said base, inoperatively collapsible into said groove, a pin operatively projecting upwardly from said vertically extending arm, and a tray having a hole in a front edge portion thereof forming a socket for removably receiving said pin.

4,174,670

MACHINES FOR SECURING TEXTILE FABRICS ONE TO ANOTHER

Ronald G. Birkhamshaw, Sutton in Ashfield, England, assignor to Mathbirk, Limited

Filed Jun. 6, 1977, Ser. No. 803,518
Int. Cl.[2] D05B *7/00*
U.S. Cl. 112—25 **7 Claims**



1. A linking machine for securing two or more pieces of textile fabric together comprising:

a plurality of extending points onto which said pieces of fabric to be joined may be threaded;

means for linking of said pieces of fabric together by a single thread chain stitch;

cutter means for removing surplus fabric on the exposed fabric side of said linking thread;

over-sew means, including a needle and thread guide means for wrapping thread around said needle, said over-sew means for forming an over-sew stitch over the edge of said fabric, wherein said needle first pierces said fabric whereupon said thread guide wraps said thread around said needle, said needle then withdrawing from said fabric and then returning over the edge of said fabric whereupon said thread guide again wraps said thread around said needle and said needle is withdrawn over the edge of said fabric; and

means for presenting said link fabric to said cutter and for presenting said fabric to said over-sew means.

4,174,671

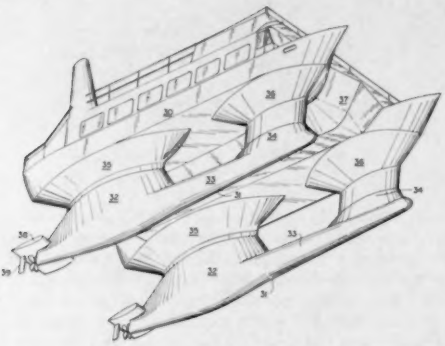
SEMISUBMERGED SHIP

Ludwig H. Seidl, Honolulu, Hi., assignor to Pacific Marine & Supply Co., Ltd., Honolulu, Hi.

Filed May 18, 1978, Ser. No. 907,122

Int. Cl.[2] B63B *1/10*

U.S. Cl. 114—61 **5 Claims**



1. A marine vessel comprising:

(a) a platform member;

(b) two parallel hulls disposed below said platform and adapted to be below the water surface when the vessel is in operation;

(c) each of said hulls comprising a pod shaped after section, a forward section having a generally rectangular cross section of substantially smaller cross-sectional area than the after section and a tubular central section, having a cross-sectional area substantially smaller than that of the forward section, joining the forward end of the after section to the after end of the forward section and supported only by the junctions with the forward and after sections;

(d) each after section being joined to said platform by a strut-like member;

(e) each forward section being joined to said platform by a strut-like member;

(f) all of said strut-like members being tapered so that their waterplane areas increase rapidly between the waterline and the junction of the strut-like member with the platform;

(g) the junctions of the strut-like members with the hull sections being so constructed that a portion of each connected hull section extends forward of the junction.

4,174,672

SHIP'S PROPELLER SHAFT SEALING ASSEMBLY

James H. Cox, 31 Hurstleigh Dr., Redhill, Surrey, RH1 2AA, England

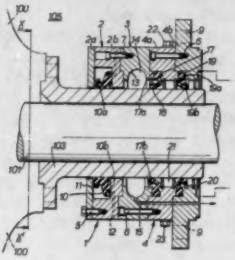
Filed Dec. 19, 1977, Ser. No. 861,709

Claims priority, application United Kingdom, Dec. 20, 1976, 53042/76

Int. Cl.[2] E21B *33/00*; F16J *9/00, 15/00*

U.S. Cl. 115—74 **8 Claims**

1. A ship's propeller shaft sealing assembly comprising a rigid housing structure accommodating two sealing means spaced axially along the shaft, the housing structure being secured to the ship's stern tube bearing so that the forward sealing means is aft of the stern tube bearing, and a chamber between the sealing means and having an outlet, an immovable rigid inner wall of the housing structure defining the radial extent of the chamber, the chamber being empty, unless there is leakage past either of the seals, and the outlet being connected to an inboard collector so as to allow such leakage to be gravity-fed from the chamber to the collector.



4,174,673

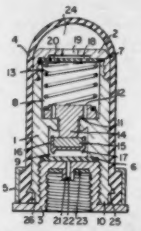
LOW PRESSURE WARNING TIRE AIR VALVE CAP

Wei-Ling Tung, No. 7, Alley 1, Lane 269, Chung-Shiao East Rd., Section 6, and Steven Kwan, No. 43, Alley 148, Lane 30, Yung-Chi Rd., both of Taipei, Taiwan

Filed Apr. 6, 1978, Ser. No. 893,852

Int. Cl.[2] B60C *23/04*

U.S. Cl. 116—34 R **3 Claims**



1. A low pressure warning cap for a pneumatic tire air valve comprising:

a generally cylindrical body having first and second ends, a cylinder adjacent the first end, a threaded connector for attachment to a conventional air valve stem of a pneumatic tire at the second end and an acting chamber connecting with and disposed intermediate the cylinder and the threaded connector;

a piston disposed in the cylinder and resiliently biased toward the acting chamber;

the cylinder having an opening at the first end;

a deformable diaphragm disposed across the acting chamber between the threaded connector and the piston;

a perforated diaphragm disposed across the cylinder adjacent the opening;

an elastic sack enveloping in air tight manner the first end including the opening;

a protuberance in the threaded connector to cooperate with the valve to open the valve upon attachment of the cap to valve, whereby, at a desired tire pressure, the deformable diaphragm is deformed by air from at the desired pressure to move the piston against the bias into air-tight angagement with the body to prevent passage of the air into the cylinder; and

the piston having means to rupture the deformable diaphragm when the piston has been moved into air-tight engagement with the body, whereby, upon the occurrence thereafter of an undesirably low tire pressure, the piston is biased against this undesirably low air pressure to allow the air into the cylinder past the piston to pass by

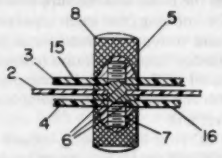
way of the perforated diaphragm and opening to inflate and rupture the sack to provide an audible indication of the undesirably low tire pressure.

4,174,674

DEVICE FOR CITIZENS BAND RADIO USERS TO DETERMINE HIGHWAY LOCATION

Richard K. Reid, 7402 NW. 23rd, Apt. 106, Bethany, Okla. 73008

Filed May 23, 1978, Ser. No. 908,677
Int. Cl.[2] G09B *19/02*; G06C *3/00*
U.S. Cl. 116—307 **5 Claims**



1. In a portable hand held mileage indicator for citizen's band radio users and the like, in vehicles having odometers, a large circular flat disc, a smaller circular flat disc superposed on either side of said large disc, said discs being centrally pivotally mounted on screw means having spaced flanged portions for relative rotation, nut means rotationally mounted on opposing ends of said screw means for locking said discs in fixed set positions, graduated scale markings on each face of said large disc and extending circumferentially therearound representing increasing and decreasing highway mileage markers, respectively, scale markings on the outermost faces of said smaller discs and extending circumferentially therearound representing vehicle odometer readings whereby highway location may be noted and broadcast to other citizen's band radio users in that vicinity by noting the last highway mileage marker passed and rotating the appropriate small disc until the last two digits of the vehicle odometer reading on that small disc scale are aligned with the scale marking on said large disc scale and locking said discs in that fixed set position so that a subsequent mileage marker location may be determined by viewing the odometer reading and determining the users highway location by reading directly from the indicator the mile marker that aligns with the last two digits of the odometer reading.

4,174,675

ANALYTICAL INSTRUMENT

Earl L. Goodwin, deceased, late of Albany, N.Y., and by Bette-Lou T. H. Goodwin, executrix, 11 S. Lake Ave., Albany, N.Y. 12208

Filed Jul. 6, 1978, Ser. No. 922,329
Int. Cl.[2] G01D *13/22*
U.S. Cl. 116—323 **10 Claims**

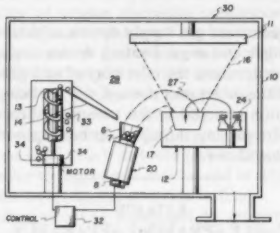
1. An analytical instrument for use with profile diagrams of materials exhibited by a detection system to monitor, detect and determine whether such detection system is working properly, and to detect in the monitoring of materials any unknown component profiled by such detection system, said analytical instrument comprising: a body means, slot means for receiving markers for securement therewith and markers; said markers having means cooperating with said slot means to permit adjustable disposition and securement where disposed of said markers relative to said slot means, said markers thusly being adjustably disposable and securable respecting said slot means to pin-point discrete points of known samples of components of materials profiled by such profile diagram to thereby serve as pin-pointing reference markers for such known components for monitoring, detecting and determining whether such detection system is working properly, and to detect in such monitoring of materials any unknown component profiled by such detection system by such unknown component lacking a pin-pointing reference marker.

4,174,676

METERING DEVICE FOR A VACUUM DEPOSITION APPARATUS

Gunther Wulff, Trübbach, Fed. Rep. of Germany, assignor to Balzers Patent- und Beteiligungs Aktiengesellschaft, Liechtenstein

Filed Sep. 28, 1977, Ser. No. 837,152
Claims priority, application Switzerland, Sep. 28, 1976, 012855/76
Int. Cl.[2] B05C *11/00*; C23C *13/12*
U.S. Cl. 118—688 **6 Claims**



1. A vapor deposition device comprising a housing defining an evacuation chamber, a heater evaporator in said housing chamber, a support for a substrate to be coated located above said heater evaporator, a feeding device for material to be evaporated located alongside said heater evaporator comprising an electromagnet including a coil, an armature associated with said coil and being movable upwardly and downwardly, a receiving trough defined on said armature with an open top for receiving the material to be evaporated therein, and control means connected to said coil for energizing said coil so that upon accumulation of a predetermined weight of material on said trough, said coil is activated to move said armature rapidly to cause ejection of the material accumulated thereon through a trajectory path upwardly and into said evaporator.

4,174,677

DEVICE FOR CROSS-LINKING OF COATING MATERIAL SUCH AS RUBBER OR PLASTIC, FOR ELECTRIC WIRE

Hiroo Nagano; Chuki Ikeda; Kenji Takahashi; Naoyoshi Kato, and Norio Sato, all of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Japan

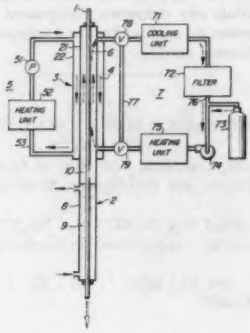
Division of Ser. No. 496,898, Aug. 12, 1974, abandoned. This application Jan. 27, 1978, Ser. No. 872,768
Claims priority, application Japan, Sep. 18, 1973, 48-109598
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—67 **10 Claims**

1. A device for cross-linking of a coating material such as rubber of plastic of an electric wire including a cross-linking tube comprising:

a heating portion through which either one of high temperature inactive gas or high temperature electrically negative gas is passed; and

a cooling portion located below and continuous with said heating portion and filled with cooling liquid;

wherein said heating portion is provided at the side thereof with a gas circulating passage having an inlet port and an outlet port, said inlet port and said outlet port of said gas circulating passage communicating with a gas exhaust port above said heating portion and a gas supply port below said heating portion respectively, said gas circulating passage having a gas cooling device, a gas cleaning



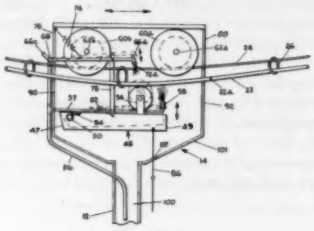
filter, a pressurized gas supply device, a blower for circulating the gas and a gas heating device arranged in the indicated order from the inlet port of said gas circulating passage to the outlet port thereof, the gas being circulated in a direction opposed to the travelling direction of said electric wire passing through said heating portion downwardly from above.

4,174,678

CABLE SPRAYING APPARATUS

William Van Den Bergh, Kentwood, Mich., assignor to Utility Contracting Co., Sparta, Mich.

Filed Sep. 23, 1977, Ser. No. 836,026
Int. Cl.[2] B05C *5/00*; B05B *3/18*
U.S. Cl. 118—307 **12 Claims**



1. In cable spraying apparatus for spraying a coating material on a cable that is suspended from an overhead supportive wire by intervally spaced connectors, said cable spraying apparatus including a frame; traveling means for suspending the frame from the overhead supportive wire for movement along the supportive wire; at least one spray nozzle mounted to the frame and pointed toward the cable; each spray nozzle being operably connected to a supply means for supplying coating material under pressure through each nozzle; the improvement comprising:

nozzle mounting means connected to the frame for mounting each spray nozzle to the frame for vertical movement with respect to the traveling means, the nozzle mounting means being responsive to the cable position and maintaining each spray nozzle at a predetermined distance from the cable as the apparatus moves along the supportive wire, even though the distance between the cable and supportive wire varies along the length of the cable, the nozzle mounting means including:

sensing means for sensing the distance of the cable below the supportive wire, the sensing means being mounted under the cable and being vertically movable in the frame with respect to the traveling means, the sensing means including biasing means for resiliently biasing the sensing means upwardly so as to ride along the underside of the cable as the apparatus moves along the supportive wire; and

nozzle moving means interconnecting the nozzle with the sensing means for vertical movement therewith such that the nozzle is spaced a predetermined distance from the cable and is maintained at that distance even though the distance between the cable and the supportive wire varies;

movement means for moving the cable spraying apparatus along the cable, said movement means comprising a pole extending downwardly from the frame toward the ground for manual movement of the frame, the supply means being movable along with the frame as the frame is moved along the supportive wire; and

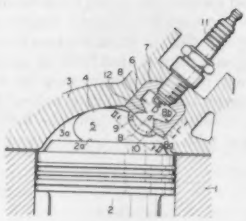
means for remotely moving the sensing means downwardly such that the nozzle and nozzle mounting means are moved away from the supportive wire and cable a sufficient distance to permit lateral movement of the apparatus to mount and dismount the apparatus on the supportive wire and cable.

4,174,679

INTERNAL COMBUSTION ENGINE WITH A SUBSIDIARY COMBUSTION CHAMBER

Masaaki Noguchi, Nagoya; Shougo Sanda, Numazu, and Masaaki Takizawa, Mishima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 704,505, Jul. 12, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,881
Claims priority, application Japan, May 27, 1976, 51-60557
Int. Cl.[2] F02B *19/08*
U.S. Cl. 123—30 D **3 Claims**



1. An internal combustion engine comprising:

a cylinder having a cylinder block and a cylinder head fixed onto said cylinder block,

a piston reciprocally movable in said cylinder block,

a main combustion chamber formed between a top surface of said piston and an inner surface of said cylinder head,

means to supply fuel directly only to said main combustion chamber,

said cylinder head having therein a subsidiary combustion chamber symmetrically extending about an axis, said subsidiary combustion chamber having a circumferential inner wall including a raised annular portion defining a restricted opening interconnecting and of smaller diameter than a substantially spherically shaped first portion of said subsidiary combustion chamber located near the main combustion chamber and a second portion of said subsidiary combustion chamber located further from the main combustion chamber than the first portion, wherein said restricted opening is the only opening in said second portion of said subsidiary combustion chamber, the volume of said first portion of said subsidiary chamber is smaller than

the volume of said second portion of said subsidiary chamber, the ratio of the diameter of said annular portion to the diameter of said second portion of said subsidiary chamber is less than 0.8, and the diameter of the second portion of the subsidiary chamber is greater than the axial length of said second portion,

passage means connecting the main combustion chamber and the subsidiary combustion chamber through the circumferential wall of said first portion of said subsidiary chamber, the inner end of said passage means being tangent to the circumferential wall of said first portion of said subsidiary chamber and extending downwardly and outwardly to the main combustion chamber to create a swirling motion of a combustible mixture in the first and second portions of said subsidiary combustion chamber, and

a spark plug having a spark gap located in the vicinity of said symmetrical axis and the second portion of said subsidiary combustion chamber, said restricted opening allowing the flow of a combustion gas from said second portion to said first portion, both of which portions are of greater diameter than the restricted opening, said combustion gas being collected in the vicinity of said symmetrical axis after said combustible mixture is ignited, while said restricted opening prevents outflow of unburned mixture from said second portion to said first portion, said unburned mixture being collected on the peripheral region in said second portion removed from said symmetrical axis due to the centrifugal force caused by said swirling motion of said combustible mixture.

4,174,680

CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM

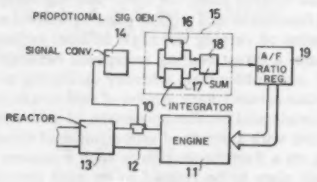
Makoto Anzai, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1976, Ser. No. 753,795

Claims priority, application Japan, Dec. 27, 1975, 50/176359[U]

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EE **10 Claims**



1. In an air-fuel ratio control system for use with an internal combustion engine including means for supplying air and fuel thereto in a ratio variable in response to a P-I control signal and including exhaust means having an exhaust gas treatment means operative when supplied with exhaust gases containing air and fuel in a certain ratio, which system includes an air-fuel ratio detector connected to said exhaust means, for producing an air-fuel ratio signal indicative of an air-fuel ratio of the exhaust gases, and a control circuit for producing said P-I control signal in response to said air-fuel ratio signal, the control circuit comprising:

an integrator connected to said air-fuel ratio detector, for integrating said air-fuel ratio signal to provide integral components of the P-I control signal on an output of the integrator;

an inverter connected to said integrator, for inverting the integrated signal from said integrator;

a switching circuit for passing therethrough the integrated signal when said air-fuel ratio signal is lower than a predetermined level and the inverted integrated signal when said air-fuel ratio signal is higher than said predetermined level to provide proportional components of the P-I control signal on an output thereof, said switching circuit providing means for varying the amplitude of the proportional components of the P-I control signal directly with the integral component; and

a summing circuit with an input connected to the outputs of the integrator and switching circuit for producing a summation of the output signals of said integrator and said switching circuit.

4,174,681

TWO-GROUP/SIMULTANEOUS FULL INJECTION CONVERSION SYSTEM FOR MULTIPLE CYLINDER ENGINES

David G. Luchaco, Macungie, Pa., assignor to The Bendix Corporation, Troy, Mich.

Filed Jul. 18, 1977, Ser. No. 816,250

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **11 Claims**

1. In an electrical fuel injection system for an internal combustion engine having a number of electromagnetically actuated injectors electrically connected to form a plurality of independent injector groups which are alternately energized during low speed operation and simultaneously energized during certain high speed and power demand regimes of engine operation and including an electrical computer responsive to a plurality of engine operating conditions for providing electrical fuel injection pulses of the exact length required to meet the instantaneous fuel requirements of the engine;

a system for accomplishing the conversion from alternate energization of the injector groups to simultaneous energization and vice versa comprising:

engine driven means providing a plurality of electrical pulse trains each of which includes pulses directly proportional in number to engine revolutions and in which pulses from separate trains do not coincide in time,

first latch means interconnected to receive said trains of pulses having output signals enabling one injector group in response to receipt of pulses from one of said trains and inhibiting another injector group,

means differentiating said pulses to form sharp timing pulses and connected said timing pulses to said computer to time the start of said electrical fuel injection pulses,

AND gate means connected to receive said timing pulses and said electrical fuel injection pulses producing output signals when said pulses coincide in time, and

second latch means responsive to said output signals connected to said first latch means for inhibiting timing pulses from one of said trains and for directing timing pulses from another train of pulses to control timing of injection pulses to all of said injectors.

4,174,682

AUXILIARY FUEL INJECTION CONTROL CIRCUIT

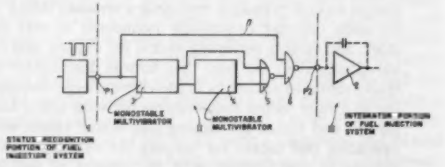
Ulrich Drews, Vaihingen-Pulverdingen, and Erich Singer, Besigheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,998

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651087

Int. Cl.[2] F02D *3/00*; F02M *7/00*

U.S. Cl. 123—32 EE **5 Claims**


MONOSTABLE MULTIVIBRATOR
MONOSTABLE MULTIVIBRATOR
INTEGRATOR PORTION OF FUEL INJECTION SYSTEM
STATUS RECOGNITION PORTION OF FUEL INJECTION SYSTEM

1. An electronic circuit for use with an electronic fuel injec-

tion system for an internal combustion engine, said engine having an air intake duct and fuel injection valves and said fuel injection system including means for making measurements of the air flow rate through said air intake duct; means for making measurements of the speed (rpm) of said engine; means for making measurements of the exhaust gas composition and for generating an exhaust gas datum; electronic fuel control means for processing said measurements and generating fuel control pulses for controlling the duration of opening of said fuel injection valves; a throttle valve transducer for generating a first signal when said throttle is closed; and means for suppressing said fuel control pulses when said throttle is closed and the engine runs at higher than idling speed; and wherein said electronic circuit comprises:

a signal-delaying subcircuit, for receiving said first signal and said fuel control pulses;

a logical gating subcircuit for receiving said delayed fuel control pulses and said first signal; and

an output circuit controlled by said logical gating subcircuit, for engaging said electronic fuel control means to supply an average (fixed) value of said exhaust gas datum; whereby the width of said fuel control pulses is set to an average value.

4,174,683

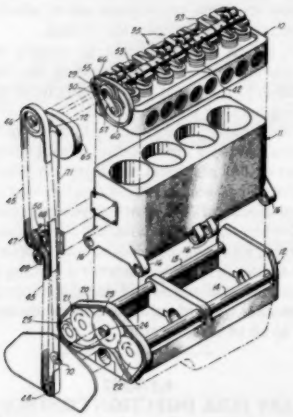
HIGH EFFICIENCY VARIABLE EXPANSION RATIO ENGINE

Howard C. Vivian, 4242 Beulah Dr., La Canada, Calif. 91011

Filed Jan. 20, 1978, Ser. No. 871,017

Int. Cl.[2] **F02B** *75/04, 75/36;* **F01L** *1/34, 1/18*

U.S. Cl. 123—48 C **13 Claims**



1. In a spark-ignition, variable-expansion ratio, four-cycle engine of the type having a plurality of cylinders equipped with pistons all of which have a power output driving connection with a common crankshaft and including means directly connected to said common crankshaft for varying the cylinder clearance volume under different power demand conditions, that improvement which comprises:

throttleless carburetor means for supplying a combustible charge to said cylinders, including a separate intake valve for each cylinder operatively connected to said crankshaft, and further including means for closing said intake valve selectively not later than bottom dead center of the intake stroke as necessary to provide a charge corresponding to torque output requirements between idling and full power, and means for closing said intake valves and for operating said means for varying the cylinder clearance volume in synchronism with the closure of said intake valves and thereby effective to maintain the engine compression ratio substantially constant over the full range of torque outputs and to increase the engine expansion ratio as the torque output is reduced.

4,174,684

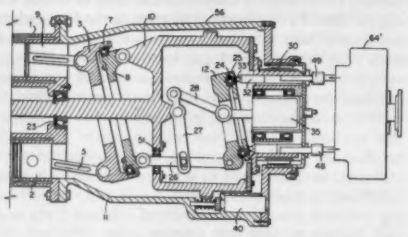
VARIABLE STROKE INTERNAL COMBUSTION ENGINE

Bernard Roseby, 150 W. Edith Ave., #43, and Eckhard P. Hallmann, 2230 Ancora Ct., both of Los Altos, Calif. 94022

Filed May 23, 1977, Ser. No. 799,660

Int. Cl.[2] **F02B** *75/04, 75/26*

U.S. Cl. 123—48 B **4 Claims**



1. A variable stroke internal combustion engine in which multiple cylinders are located around the axial center line of said engine, parallel to and equidistant from said center line, a cylinder head of annular form in which combustion chambers are formed and on which valves and valve actuating mechanisms and a rotary, circular cam disc are mounted, a wobble plate, on one face of which is formed a mounting plate for a thrust type ball bearing, pistons operating within said cylinders and attached, by means of a connecting link, to a wobble plate, said connecting links being of the conventional gudgeon pin attachment type at the piston end while having, at the opposite end a spherical form, said spherical form being retained in a pivotal manner within a female spherical enclosure formed between a pair of lugs, one of which is formed integrally on the face of said wobble plate, the other said lug being detachable from and fastened to said wobble plate by screws, a swash plate with a means of varying the angle of axial inclination of said swash plate, a thrust bearing interposed between said swash plate and said wobble plate whereby oscillating motion of said wobble plate causes rotary motion of said swash plate in order to accomodate said oscillatory motion of said wobble plate, a carrier plate with a means of supporting said swash plate on a mounting on a fixed projection in such a manner as to allow said swash plate to be rotated in an axial direction about a swivel bearing inserted into a cavity on said carrier plate projection, a sliding link attached to a swivel mounting on said swash plate at the opposite side of said carrier plate to said carrier plate projection and passing through a spherical bearing mounted within a space in said carrier plate face, a linkage comprising a slotted bar and pivots whereby a force applied to said linkage by a hydraulic piston causes said swash plate to be so rotated about said fixed carrier plate projection as to change the angle of axial inclination of said swash plate, said carrier plate being carried in a rotary manner by said swash plate by the transferring of rotary forces through said mounting connections of said swash plate on to said carrier plate, a gear form on the peripheral face of said carrier plate whereby the rotary motion of said carrier plate may be transferred through a meshing gear to an output shaft, whereby the action of said pistons, when driven along said cylinders by means of combustion and expansion of gases, causes said wobble plate to oscillate and thereby generate reciprocating motion in said piston, said reciprocating motion causing a four stroke cycle of an internal combustion nature to occur, the power or combustion stroke of said cycle being the driving force causing said wobble plate to oscillate sequentially in response to said power or combustion strokes, said piston connecting links causing that side of said wobble plate to react against said swash plate

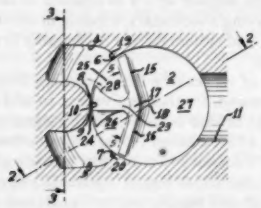
through said thrust bearing said swash plate being forced to rotate around the said thrust bearing to allow said oscillations and thereby translate said piston reciprocating motion into swash plate rotary motion, said swash plate axial angle of inclination being controlled by said angle changing linkage similarly controlling and, by means of motion of said angle changing linkage, being changed by an operator causing said angle changing linkage to be moved, thereby causes a change in the distance from one extreme point of wobble plate oscillation to the opposite extreme point of wobble plate oscillation, said extreme points being at opposing sides of said swash plate, thereby similarly causing the distance travelled by said pistons to be changed in such a manner as to cause the stroke of said pistons to be changed whereby the proximity of said pistons to said combustion chambers does not vary with said change of stroke, that point of said stroke being determined by the height of said fixed carrier plate projection point around which said swash plate rotates, a shaft projecting from the center of said carrier plate passing through openings in the centers of said swash plate and said wobble plate and said cylinder block, thereby passing to the cylinder head end of said engine where said shaft causes to be driven a valve actuating mechanism comprising a suitable speed reducing means, a disc, on the face of said disc being formed cam shapes in such a manner that they are caused, during rotary motion of said disc in response to said driving mechanism, to pass over rollers said rollers being mounted on a pivotal mechanism in such a manner as to be forced against stems of valves in response to being moved by said cam shapes and thereby causes said valves to be opened against springs and permit the passage of inlet and exhaust gases to and from said combustion chambers in such a sequence as to generate said four stroke cycle of operation as said gases are ignited by a spark plug energized by electrical means from a distributing rotor mechanism driven by said shaft mechanism by which said cam bearing disc is driven.

4,174,685

TWO STROKE CYCLE INTERNAL COMBUSTION ENGINE

Hermann R. E. Meier, Palma de Mallorca, Spain, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Jul. 5, 1978, Ser. No. 922,093
Int. Cl.[2] F02F *3/24*
U.S. Cl. 123—73 A **9 Claims**



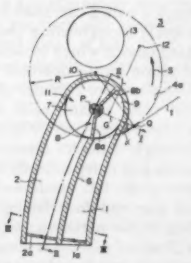
1. A two stroke cycle internal combustion engine having a piston reciprocating to and from a bottom dead center position in a closed cylinder, said cylinder having a wall provided with two inlet ports and generally oppositely disposed outlet port means, said inlet ports being circumferentially spaced and having inner edges defining an intermediate section of said wall therebetween, and a generally T-shaped guide outstanding from the face of said piston, the arms of said T-shaped guide comprising a first flange portion outstanding from the face of the piston extending laterally of the path between said inlet ports and said outlet port means and spaced therebetween and delimiting an open inlet chamber between said first flange portion, on the one hand, and said inlet ports and intermediate wall section, on the other hand, the leg of said T-shaped guide comprising a second flange portion outstanding from the face of the piston and extending from an intermediate portion of said first flange portion toward said intermediate wall section and terminating in an end face which confronts said intermediate section when said piston is at bottom dead center position, said flange portions extending outwardly from roots at which they join the piston face to outer flange edges, characterized in that, said end face increases in width from the outer flange edge to the root of said second flange portion and has a width at said root greater than the distance between the upper inner edges of said ports, said piston and the edges of said inlet ports defining inlet openings into said cylinder having generally trapezoidal shapes when said piston is in bottom dead center position, each such opening being defined between an upper port edge substantially parallel to the face of the piston, an outer edge generally perpendicular to the piston face defined by those respective edges of the outer ends of said arms which delimit such inlet chamber, and each such opening being further defined by a lower edge defined by the piston face and by an inclined inner edge extending upwardly and inwardly from the inner end of said lower edge, said inwardly inclined inner edges terminating at spaced apart intersections with said upper edges, said inner edges being defined by the outer edges of said end face.

4,174,686

INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroshi Shimizu, Higashihiroshima, and Masamichi Shinohara, Hiroshima, both of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 7, 1977, Ser. No. 840,365
Claims priority, application Japan, Oct. 9, 1976, 51-121531; Dec. 24, 1976, 51-175089[U]
Int. Cl.[2] F02B *13/00*
U.S. Cl. 123—75 B **3 Claims**



1. Internal combustion engine comprising cylinder means having cylinder bore means, piston means disposed in said cylinder bore means for reciprocating movement so as to define combustion chamber means therein, intake port means having a center and provided in said cylinder means to open to said combustion chamber means, first and second intake passage means which are separated one from the other and communicate with said intake port means, said first intake passage means being smaller in cross-sectional area than the second intake passage means, wall means extending radially of said intake port means and separating said first and second intake passage means at said intake port means, means for closing said second intake passage means at least under light load engine operation, intake valve means having a back contour and provided for closing said intake port means, said first intake passage means having a centroid in a cross-section at the intake port means and being so located that a line passing through the centroid and the center of the intake port means intersects a projection of said cylinder bore means at a point of intersection and makes an angle of 50° to 80° with a tangential line of said projection of the cylinder bore means at said point of intersection, whereby the first intake passage means is located with respect to the axis of said cylinder bore means radially out-

wardly of said second intake passage means at said intake port means.

4,174,687

BRAKING DEVICE FOR FOUR-STROKE CYCLE RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

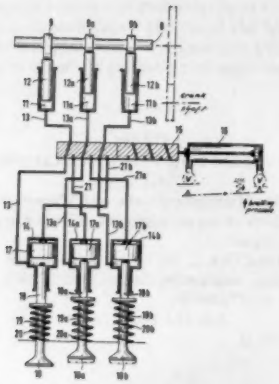
Wolfgang Fuhrmann, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,520

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658927

Int. Cl.[2] F02L *9/02;* F02D *31/00*

U.S. Cl. 123—90.13 7 Claims



1. In combination with a cam shaft and outlet valve means of a four stroke cycle reciprocating piston internal combustion engine, a braking device which includes: fluid displacing actuating cylinder-piston means operable by said cam shaft, fluid operable two-step control cylinder-piston means for controlling said outlet valve means, each of said control cylinder piston means comprising two different diameter bores with two correspondingly different diameter pistons each reciprocating relative to and independently of the other, the shorter diameter piston of the last mentioned two different diameter pistons having one end face facing an adjacent oppositely located endface of the pertaining larger diameter piston and being located closer to said valve means than the larger diameter piston of said last mentioned two different diameter pistons, control means interposed between said actuating cylinder-piston means and said control cylinder-piston means, first conduit means leading from said actuating cylinder-piston means to said control means, second conduit means leading from said control means to said control cylinder piston means for fluid communication with those piston areas of said larger diameter and shorter diameter pistons which face each other, third conduit means leading from said control means to that surface of said larger diameter piston of said two-step control cylinder piston-means which faces away from the pertaining shorter diameter piston, said control means including a reciprocating member having first passage means therein and being movable into a first control position to make said first passage means effective for establishing fluid communication between said first and second conduit means, said reciprocating member also being movable into a second control position to make said second passage means effective to establish fluid communication between said first and third conduit means, the arrangement being such that in said second control position of said reciprocating member the respective connection of said third conduit means with said second passage means is effected in a different order than the connection of said second conduit means with said first passage means in said first control position of said reciprocating member when in both position looking in the same direction with regard to the longitudinal extension of said reciprocating member thereby in said second control position of said reciprocating member advancing the opening point of said outlet valve means while reducing the maximum opening stroke of said outlet valve means.

4,174,688

DIGITAL-ELECTRONIC ENGINE IGNITION SYSTEM

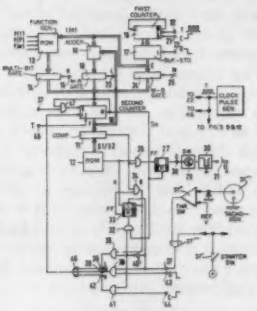
Guenther Hönig, Markgröningen; Uwe Kiencke, Ludwigsburg, and Martin Zechnall, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,432

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2655948

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 D 50 Claims



1. A digital-electronically controlled ignition system for an internal combustion engine comprising an ignition transformer, a circuit including the primary coil of said transformer and an electronic switch, an electronic control circuit for said electronic switch, and a signal generator operated by said engine providing, in response to at least one reference mark of a rotary portion of said engine, at least signals (A) having steep leading (B) and trailing (C) edges, which signals are representative of a predetermined angular sector of rotation of said engine, said transformer having a secondary winding in circuit with at least one spark gap, said system further comprising in said electronic control circuit:

a generator of waves of a fixed counting frequency (T);

means responsive, for their activation, to said angular sector signals (A) of said engine-operated signal generator, and including a first counter (16) arranged to be driven by said counting frequency waves, for providing in successive counting operations digital signals (E) dependent on the duration of said angular sector signals and thereby representative of engine speed;

means for maintaining a substantially constant time interval of closure of said electronic switch (29) by predicing the current rise time in said primary coil of said ignition transformer (30) up to substantially maximum current therein; said means including a second counter (10) connected thereto to count at said counting frequency (T), and a recognition circuit connected thereto, including a digital comparator, for recognizing at least two threshold count value conditions (S1, S0; S3, S4) of said second counter (10) and for producing signals in response thereto, and

logic circuits responsive to signals produced by said recognition circuits for causing the beginning and for causing the end of the closure interval of said electronic switch (29);

means (24) for transferring each said digital signal (E) representative of engine speed in the interval between counting operations of said first counter (16) to said second counter (10), for varying the timing of said time interval of switch

closure in a subsequent ignition cycle in dependence on engine speed;

function generator means (13) for obtaining an ignition timing count value selected in accordance with the combination of an engine speed parameter and other engine operation parameters, to which means said parameters are provided as digital input signals; and

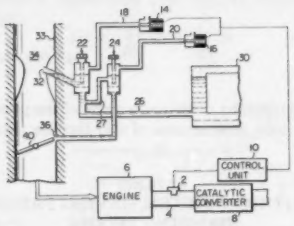
means for supplying said ignition timing count value as a correction of the momentary count condition of said second counter (10) during the counting operation of said second counter at the moment of occurrence of a signal (C) indicative of the transit of one said reference mark of said rotary portion of said engine, in order to shift at least one of the beginning and the end of said time interval of switch closure.

4,174,689

ELECTRONIC CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 23, 1977, Ser. No. 780,688
Claims priority, application Japan, Mar. 24, 1976, 51-31449
Int. Cl.² F02B *3/00*
U.S. Cl. 123—119 EC **3 Claims**



1. An electronic closed loop air-fuel ratio control system for supplying an optimum air-fuel mixture to an internal combustion engine, which system comprises in combination:

an air-fuel mixture supply assembly;

an exhaust pipe;

an exhaust gas sensor provided in the exhaust pipe for sensing the concentration of a component in exhaust gases, generating a first signal representative thereof characterized by upper and lower constant voltage maxima and an analog region as a function of air-fuel mixture therebetween, in the vicinity of stoichiometry;

a difference detecting circuit responsive to said first signal for generating an analog second signal representative of the difference between magnitudes of the first signal from the exhaust gas sensor and a reference signal;

a control signal generator responsive to said second signal, said control signal generator including first means for differentiating the second signal, second means for integrating the second signal, third means for proportionally amplifying the second signal, said first, second and third means being electrically connected in parallel and operating on said second signal simultaneously, and fourth means for summing the output signals of said first means, said second means of said third means to produce a control signal; and

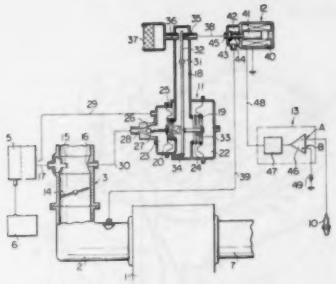
an actuator provided in the air-fuel mixture supply assembly responsive to the control signal for controlling the air-fuel ratio of an air-fuel mixture fed to the engine.

4,174,690

AIR-FUEL RATIO CONTROL DEVICE

Masaharu Sumiyoshi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 25, 1977, Ser. No. 854,678
Claims priority, application Japan, Sep. 7, 1977, 52-106752
Int. Cl.² F02M *7/00*; F01N *3/10*
U.S. Cl. 123—119 EC **23 Claims**



1. An air-fuel ratio controlling device of an internal combustion engine having a gas flow passage comprising an intake passage and an exhaust passage, said device comprising:

a λ sensor disposed in the exhaust passage for providing a rich signal indicating that the total air-fuel ratio is on the rich side of the stoichiometric air-fuel ratio and a lean signal indicating that the total air-fuel ratio is on the lean side of the stoichiometric air-fuel ratio;

valve means having a valve for controlling the amount of supplementary fluid fed into the gas flow passage; and

valve actuating means for alternately opening and closing said valve and for mechanically changing the opening speed and the closing speed of said valve in response to said rich and said lean signals so that one of said opening and closing speeds in rapidly and gradually changed, while the other of said opening and closing speeds is slowly and gradually changed during the opening and closing operation so as to make the mean value of the total air-fuel ratio precisely equal to a predetermined air-fuel ratio,

said valve actuating means comprises a vacuum chamber, a vacuum control device for controlling the vacuum level in said vacuum chamber in response to said rich and said lean signals, and a valve actuating device for actuating said valve in response to change in the vacuum level in said vacuum chamber; and

said vacuum control device comprises an air port communicating said vacuum chamber with the atmosphere, a vacuum source, a vacuum port communicating said vacuum chamber with said vacuum source, a flapper cooperating with said air and said vacuum ports, a flapper actuating device for gradually opening said air port and gradually closing said vacuum port in accordance with increases in the vacuum level in said vacuum chamber, and a valve device for intermittently establishing the fluid connection between said vacuum port and said vacuum source in response to said rich and said lean signals.

4,174,691

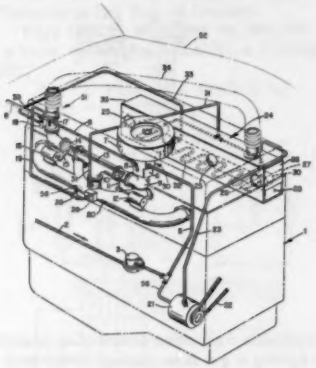
FUEL-AIR SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Charles H. Trexler, Sr., 6229 Debora Dr., Richmond, Va. 23225

Filed Jan. 27, 1978, Ser. No. 872,946
Int. Cl.² F02M *31/00*
U.S. Cl. 123—133 **11 Claims**

1. A fuel-air supply system for supplying fuel and combustion air to an internal combustion engine and comprising car-

buretor means providing a unheated supply of fuel and air for said engine, further means for heating unmixed liquid fuel and combustion air to provide a heated supply of liquid fuel and combustion air in which the heated fuel and heated air are unmixed, and means responsive to the temperature of the liquid fuel being heated by said further means for (a) passing the supply of fuel and air from said carburetor means to said engine while blocking the supply of fuel and air from said further



means to said engine when the temperature of the fuel being heated by said further means is less than a predetermined value and (b) for passing the heated liquid fuel and heated air from said further means to said engine without intermixing the heated liquid fuel and heated air while blocking the unheated supply of fuel and air from said carburetor means when the temperature of the fuel being heated by said further means becomes equal to or greater than said predetermined value.

4,174,692

FUEL INJECTION DEVICE

Wolf Wessel, Oberriexingen; Gerhard Stumpp, Stuttgart, and Heinrich Knapp, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

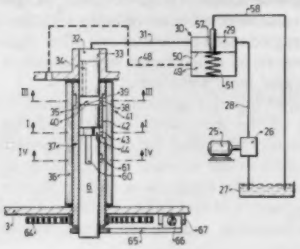
Filed Oct. 17, 1977, Ser. No. 842,996

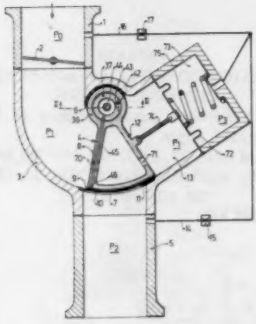
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652347

Int. Cl.[2] **F02M** *39/00*

U.S. Cl. 123—139 AW **11 Claims**

1. A fuel injection device for mixture compressing, externally ignited internal combustion engines provided with an arbitrarily actuated throttle valve and a pivotally mounted air flow responsive member incorporated with a fuel metering valve rotatably disposed in an air induction tube and means for subjecting said air flow responsive member to a restoring force in the closing direction in opposition to the force of air flow, the improvement wherein said air flow is arranged downstream of said throttle valve and including a return force means, said air flow responsive member including one surface that oscillates into a chamber, said chamber being connected with said air induction tube downstream of the air flow responsive member by means of a first throttle valve element, and with said air induction tube upstream of said throttle valve by means of a second throttle valve element, said restoring force being dependent on the pressure in said chamber so as to decrease the pressure of said return force means as said throttle





valve opens to thereby cause an increase of the pressure in said air induction tube downstream of said throttle valve.

4,174,693

FUEL INJECTION SYSTEM HAVING PRESSURIZED DAMPING MEANS

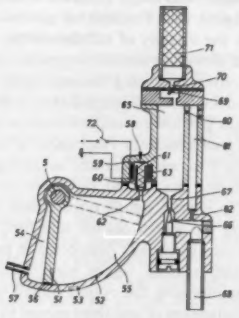
Johannes Steinwart, Obersulm-Willsbach; Gerhard Maurhoff, and Armin Bauder, both of Neckarsulm, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,241

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656538

Int. Cl.[2] **F02M** *39/00;* **F02N** *9/00;* **F02M** *37/06*

U.S. Cl. 123—139 AW **9 Claims**



1. A fuel injection system for a mixture compressing spark ignition internal combusion engine having means for injection of fuel into the air intake of the engine, comprising:

a fuel metering valve for dispensing to one or more injection jets a quantity of fuel related to the quantity of air flowing through said intake;

adjustable throttle valve in said air intake;

an air flow measuring element positioned within said intake, said measuring element being movable against a restoring force in accordance with the quantity of air flowing through said intake, said measuring element being arranged to actuate a control element of said fuel metering valve;

A damping device having a damping element connected to said measuring element;

two damping chambers having a throttling passage therebetween, said damping element being movable to displace fuel between said two damping chambers via said throttling passage;

a fuel pump connected to one of said damping chambers to provide fuel under pressure thereto, said fuel pump adapted for delivering fuel to said metering valve; and

a discharge port connected to the second damping chamber via a thermally controlled outlet valve.

4,174,694

FUEL INJECTION CONTROL SYSTEM

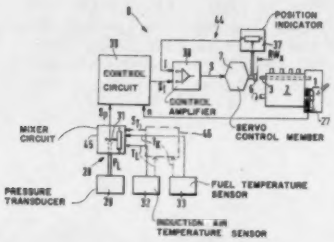
Wolf Wessel, Oberriexingen, and Wilfried Sautter, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,364

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650246

Int. Cl.² F02M *59/20*

U.S. Cl. 123—140 MC **9 Claims**



1. A control system for use in association with a fuel injection pump of an internal combustion engine, said injection pump having a fuel rack, said control system including control means for positioning the travel of said fuel rack and further including a servo-mechanism for determining the position of said control means, said servo-mechanism including an electronic controller connected to receive engine-related signals to thereby set the position of said control means, and wherein the improvement comprises:

a first transducer, disposed to experience the temperature of the air aspirated by the engine for generating a first signal related to the induction air temperature;

a second transducer, disposed to experience the temperature of the fuel delivered to said pump for generating a second signal related to the fuel temperature;

an electrical circuit for receiving said first and second signals and for providing a composite signal related to the difference of said first and second signals, said composite signal being applied to said electronic controller to thereby correct the control of the position of said servo-mechanism and said control means; whereby the amount of fuel admitted to said engine is limited.

4,174,695

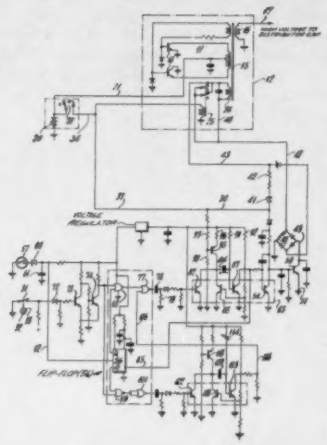
AC TYPE IGNITION SYSTEM WITH TWO TIME DELAY CIRCUITS

Robert E. Canup, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,954

Int. Cl.² F02P *5/02, 1/00*

U.S. Cl. 123—148 E **4 Claims**



1. In combination with a controlled-spark-duration ignition system for an internal combustion engine, said system having a high-frequency continuous-wave oscillator including a transformer having a high voltage output winding adapted for connection to a sparking circuit, an oscillator control winding on said transformer for starting and stopping oscillation, and electronic switch means comprising a transistor connected in series with said oscillator control winding, trigger means for switching said transistor from conducting to non-conducting state and back, and means for producing an engine timed signal for controlling said trigger means,

the improvement comprising a pair of electrical time duration control means each for producing a time delay inversely proportional to the speed of said engine, and

circuit means for alternatively connecting only one or both of said time duration control means in series between said engine timed signal and said trigger means,

said circuit means comprising

a flip-flop,

a switch for determining the state of said flip-flop, and

a pair of NOR gates controlled by the state of said flip-flop.

4,174,696

IGNITION SYSTEM

Werner Jundt, Ludwigsburg; Bernd Bodig, Leinfelden; Heinz Decker, Vaihingen; Günther Schmidt; Bert Wurst, both of Ludwigsburg; Karl Seeger, Ditzingen, and Herman Roozenbeek, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,627

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701968; Oct. 19, 1977, 2746885

Int. Cl.² F02P *5/04*

U.S. Cl. 123—148 E **26 Claims**

1. In an ignition system having

spark creating means (14, 17),

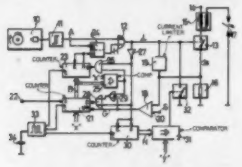
and controllable switch means (13) connected to said spark creating means for permitting and blocking current flow through said spark creating means when in a first and second state respectively,

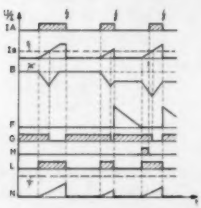
and means (**10**) for furnishing a sequence of first ignition signals, each for timing the furnishing of a spark,

an ignition control system comprising, in accordance with this invention, means (**12**) for switching said controllable switch means to said second state under control of said first ignition signals;

first storage means (**21**) for furnishing a first storage signal representative of a predetermined count;

first storage signal changing means (**28, 29, 18, 33**) for changing said first storage signal in a first direction for a predetermined time period and in a second direction opposite to said first direction for a time period corresponding to the time the current in said spark creating means exceeds a predetermined threshold value, thereby creating a current-depending modified first storage signal;





a second storage means (**23**);

transfer means (**25, 26**) for transferring said current-dependent modified first storage signal to said second storage means under control of said first ignition signal, thereby creating a current-depending second storage signal;

second storage signal changing means connected to said second storage means and continuously changing said second storage signal in a predetermined direction;

and switch control means (**24**) connected to and controlled by said second storage means and further connected for switching said controllable switch means (**13**) back to said first state when said second storage signal reaches a predetermined threshold value.

4,174,697

SYSTEM FOR ADVANCING THE IGNITION TIME IN IGNITION SYSTEMS HAVING A MAGNETO GENERATOR

Jiri Podrapsky, Buchschwabach, and Josef Orova, Schwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,684

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709745

Int. Cl.[2] **F02P** *1/00, 5/04*

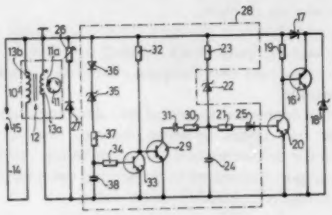
U.S. Cl. 123—148 E **7 Claims**

1. In an ignition system for an internal combustion engine, said ignition system having a rotating magneto system driven by said engine and armature means including a primary winding (**13***a*) and a secondary winding (**13***b*) cooperating with said rotating magneto system, a spark plug connected to said secondary winding, and ignition starting means (**16**) connected to said primary winding for starting the ignition process in response to an ignition timing signal:

timing means (**28, 20**) connected to said primary winding and said ignition starting means, for furnishing said ignition starting signal to said ignition starting means at first predetermined instants in the cycle of said engine when said engine is operating at a speed less than a predetermined speed, and at second time instants preceding said first time instants in each cycle of said engine when said engine is operating at a speed exceeding said predetermined speed, said timing means comprising

threshold means (**22**) for furnishing a first threshold signal when the voltage across said primary winding exceeds a first predetermined voltage;

time constant furnishing means (**31, 30, 24, 23**) connected to said threshold means for furnishing said ignition starting



signal a predetermined time period following receipt of said first threshold signal;

switch means (**29; 41**) having a first and second stable state, connected to said time constant furnishing means, for shortening said predetermined time period when in said second stable state; and connecting means

for connecting said switch means to said primary in such a manner that said switch means switches from said first to said second stable state prior to the ignition time when the speed of said engine exceeds said predetermined speed.

4,174,698

IN-LINE TWO-CYLINDER ENGINE

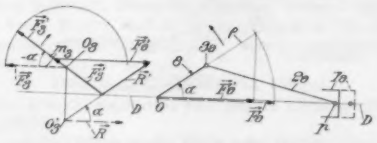
Jean G. A. Dupin, Versailles, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Jul. 29, 1977, Ser. No. 820,242

Claims priority, application France, Aug. 5, 1976, 76 24003

Int. Cl.[2] **F16F** *15/26*

U.S. Cl. 123—192 B **11 Claims**



1. A two-cylinder engine comprising:

first and second cylinders arranged in line;

first and second pistons received in said first and second cylinders respectively for reciprocation therein;

a crankshaft having first and second crankpins set at 360°;

first and second connecting rods connecting said first and second pistons to said first and second crankpins respectively, said crankshaft having an axis perpendicular to a central plane of the engine in which lies the resultant of the reciprocating inertia forces to be balanced, said crankshaft being set so that its centre of gravity is remote from said crankpins when said pistons are at top dead centre; and

balancing means in the form of a first counterweight rotatable about an axis of rotation parallel to said crankshaft in the opposite direction to but at the same speed as said crankshaft, the centre of gravity of said first counterweight lying in said central plane of the engine, said first counterweight being of a size and construction such as to develop a centrifugal force having an amplitude which is

half the maximum amplitude of the reciprocating rectilinear inertia forces of the engine, said axis of rotation of said first counterweight being disposed outside the plane defined by the axes of said first and second cylinders;

the engine being characterized by:

means for compensating for the resultant of the centrifugal force of said first counterweight and of the

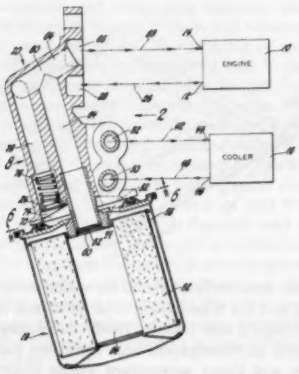
reciprocating rectilinear inertia forces of the engine, said compensating means comprising at least one second counterweight rotatable in the same direction and at the same speed as said crankshaft, said compensating means being adapted to produce a compensating force which always passes through a point disposed in said central plane of the engine symmetrically of the axis of rotation of said first counterweight relative to the plane defined by the axes of said first and second cylinders, the compensating force so opposing the resultant as to cancel out the latter.

4,174,699

ENGINE OIL PROCESSING SYSTEM

Lloyd T. Gill, Okemos, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1977, Ser. No. 864,528
Int. Cl.[2] F01M *1/02*
U.S. Cl. 123—196 S **5 Claims**



1. An engine lubricating oil processing system comprising:

an engine when running normally receiving cool, clean lubricating oil and discharging hot, dirty lubricating oil;

a filter base secured to said engine and having a first inlet receiving the hot, dirty oil discharged from said engine, a first outlet, and a first passage connecting said first inlet and said first outlet and conducting to said first outlet the hot, dirty oil received by said first inlet;

an oil cooler having an inlet connected with said filter base first outlet to receive hot, dirty oil therefrom, and an outlet to discharge cool, dirty oil; said oil cooler removing heat from the oil passing therethrough;

said filter base having a second inlet and a second outlet connected in fluid flow relation by a second passage in said base, said second inlet receiving oil from said cooler outlet;

an oil filter associated with said filter base and having an inlet and an outlet, said filter inlet receiving oil from said filter base second outlet;

said filter base having a third inlet and a third outlet connected in fluid flow relation by a third passage in said base, said filter outlet being connected to said filter base third inlet to deliver cool, clean oil thereto, and said filter base third outlet being connected to deliver oil to said engine;

said filter base having an oil cooler bypass valve therein provided with an inlet and an outlet with the inlet thereof fluid connected to said first passage between said filter base first inlet and first outlet to receive the hot, dirty oil from said engine, and the cooler bypass valve outlet fluid connected to said second passage between said filter base second inlet and second outlet; said cooler bypass valve opening, only upon a predetermined back pressure caused by undue oil flow restriction in said cooler, to bypass a predetermined limited amount of hot, dirty oil from said base first passage to said base second passage without passing through said cooler;

said filter base further having a filter bypass valve therein provided with an inlet and an outlet with the inlet thereof fluid connected to said filter base second passage between said filter base second inlet and second outlet to receive cool, dirty oil from said cooler and any bypassed hot, dirty oil from said cooler bypass valve, said filter bypass valve outlet being fluid connected to said filter base third passage; said filter bypass valve opening, only upon a predetermined back pressure caused by undue oil flow restriction in said filter, to bypass a predetermined limited amount of oil flowing through said filter base second passage to said filter base third passage without passing through said filter; said system operating

When both of said bypass valves are closed to deliver hot, dirty oil to said cooler from said engine; remove heat from that oil; deliver cool, dirty oil to said filter; clean that oil; and return cool, clean oil to said engine;

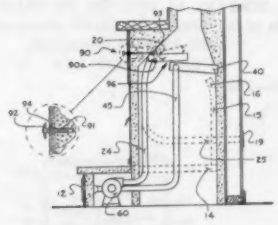
When said cooler bypass valve is open to deliver a mixture of hot, dirty oil and cool, dirty oil to said filter; and when said filter bypass valve is open to deliver a mixture of dirty and clean oil to said engine which will be cool oil when said cooler bypass valve is closed and will be a mixture of hot and cool oil when said cooler bypass valve is also open.

4,174,700

FIREPLACE

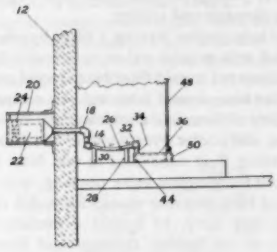
Gunther M. Bartsch, P.O. Box 1935, Zephyr Cove, Nev. 89448

Filed Nov. 7, 1977, Ser. No. 848,908
Int. Cl.[2] F24B *7/00*; F23L *3/00*
U.S. Cl. 126—121 **15 Claims**



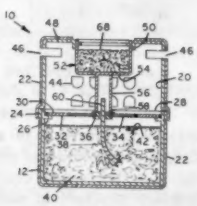
1. The combination with a fireplace of: a first hollow chamber fixed to the fireplace structure and covering a portion of the fireplace throat; a second hollow chamber pivotally connected to said fireplace structure in such manner as to be capable of covering essentially all of said fireplace throat in combination with the said first chamber and moveable in such manner as to create an opening between the said two chambers within the throat; a first air inlet means connected to the interior of said first chamber; a second air inlet means connected to the interior of said second chamber; a first hot air outlet means connected to the interior of said first chamber; a second hot air outlet means connected to the interior of said second chamber; and means to cause air to circulate through each of said chambers from its inlet to its outlet means.

4,174,701
FIREPLACE SYSTEM
Thayne R. Gneiting, Rte. 4, Box 256, Blackfoot, Id. 83221
Filed May 3, 1977, Ser. No. 793,377
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **2 Claims**



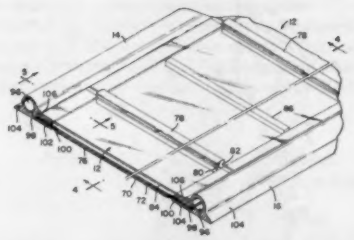
1. A fireplace device comprising a plurality of arcuate hollow tubular members for holding logs, disposed in a fireplace, a rear header connected to said tubular members, an air inlet pipe connected to said rear header, a housing disposed at the rear of the fireplace and outside the back wall of the fireplace, a motor and intake fan in said housing to supply cold outside air to said inlet pipe and rear header and tubular members, a front header connected to the front end of said tubular members and disposed in the fireplace, a substantially horizontal housing connected to said front header and disposed in the fireplace to receive hot air from said hollow members, a plurality of apertures in said hollow members to supply fresh air from combustion, glass panels closing off the front of the fireplace to prevent air from the room in which it is located from entering the fireplace, said horizontal housing having a central inlet adjacent its rear to receive heated air from said front header and oppositely disposed hot air outlets below said glass panels, and a plurality of vertical alternating panels in said horizontal housing to force heated air to pass therethrough in a tortuous path before discharge through its outlets.

4,174,702
DISPOSABLE CATALYTIC HEATER
Alfred A. Rappaport, Apt. 305 2081 S. Ocean Dr., Hallandale, Fla. 33009
Filed Oct. 14, 1977, Ser. No. 842,050
The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.
Int. Cl.[2] A61F *7/06*
U.S. Cl. 126—208 **20 Claims**



1. A catalytic heater (**10, 70**) comprising a sealed lower section fuel cartridge (**12, 72**), an upper chimney section (**20, 102**), said sealed lower section having a manually removable sealing cover (**14, 18, 96**), said sections having complementary mating edges (**24, 28, 111, 114**) in the absence of said sealing cover, said lower cartridge section having an inwardly extending ledge (**26, 112**) spaced somewhat below its mating edge (**28, 114**), said cartridge section having fuel material (**40, 78**) therein, both said sections having a heat insulating coating (**22, 107**) directly thereon, a catalytic member comprising a single plane frame member (**30, 88**) fitting on and supported on said ledge, a catalyst impregnated stainless steel member (**34, 86**)in said plane supported in said catalytic frame member over said fuel material, said stainless steel member having a wick receiving openings (**36, 84**) centrally located therein, a wick (**38, 81**) in said fuel material extendable up through said wick opening, a snuffer tube (**56, 110**) mounted centrally inside said chimney section and contacting said catalytic member about said wick (**60,82**) extending therethrough, said chimney section having a plurality of inlet openings (**44, 104**) adjacent its bottom edge and a plurality of combustion product exit openings (**46, 106**) adjacent its roof (**48, 108**).

4,174,703
SOLAR HEAT ROOFING SYSTEM
Bruce H. Blakey, Seattle, Wash., and Douglas R. Pohl, Ogden, Utah, assignors to Western Marine Electronics, Inc., Seattle, Wash.
Filed May 31, 1977, Ser. No. 801,544
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—430 **4 Claims**



1. A solar heat roofing system for waterproofing the roof of a building and for transferring solar heat to a heat utilization device through a heat transfer fluid, comprising:

a plurality of waterproof, heat absorbing panels including upper and lower waterproof sheets connected to each other along spaced apart linear paths thereby forming elongated channels for said transfer fluid extending from the top edges to the bottom edges of said panels with a side edge of each lower sheet projecting laterally beyond the adjoining side edge of said upper sheet by a first distance with the opposite side edge of said upper sheet projecting laterally beyond the adjoining side edge of said lower sheet by said first distance such that the upper sheet of each panel may overlap the lower sheet of an adjacent panel with the thickness of said overlapping portions being substantially identical to the remainder of said panel;

inlet and outlet manifolds extending perpendicularly to said fluid channels at opposite ends of said panel, each of said manifolds including an elongated, fluid impermeable conduit continuously communicating with a slot extending continuously along one side of said manifold, said slot receiving the respective end of said panel such that said fluid channels communicate with said conduit;

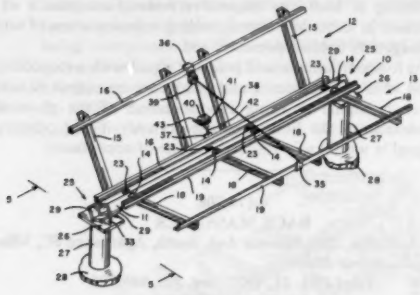
means for conveying said heat transfer fluid from said heat utilization device to the conduit of said inlet manifold; and

means for conveying said heat transfer fluid from the conduit of said outlet manifold to said heat utilization device such that said heat transfer fluid recirculates through said panels thereby delivering heat to said heat utilization device and said panels waterproof the roof of said building.

4,174,704
SUPPORT SYSTEM

Terry L. Nelson, 555 Bostwick Ave., P.O. Box 3036 Barnum Sta., Bridgeport, Conn. 06605

Filed Mar. 10, 1978, Ser. No. 885,151
Int. Cl.² F24J *3/02*
U.S. Cl. 126—438 **12 Claims**



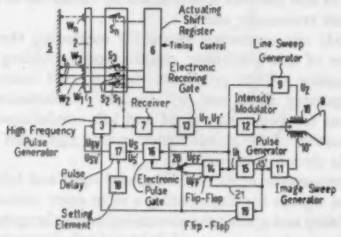
1. A support structure adapted to support opposed elements at an angle relative to horizontal and facing each other in a cooperative relationship, said structure having a generally V-shaped cross-section and comprising opposed wing members which form the arms of said V-shape and which are commonly attached to an elongate tubular member of rectangular cross-section which comprises the apex of said V-shape, said tubular member being supported on edge so that the sides of said rectangular cross-section adjacent said edge extend upwardly at angles relative to horizontal, one of said sides having attached thereto, along the length of said tubular member, a multiplicity of spaced beams which extend upwardly and outwardly of said tubular member to form support ribs for one of said wing members comprising an arm of said V-shape, a second side of said tubular member opposite said one side having attached thereto, along the length of said tubular member, a multiplicity of spaced beams which extend upwardly and outwardly of said tubular member to form support ribs for the other of said wing members comprising the other arm of said V-shape, whereby the weight of said wing members and of elements attached thereto is adapted to be supported solely by said tubular member.

4,174,705
ULTRASONIC IMAGING APPARATUS OPERATING ACCORDING TO THE IMPULSE-ECHO METHOD

Klaus Buchner, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,498
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628568
Int. Cl.² G01S *9/66*; A61R *10/00*
U.S. Cl. 128—660 **6 Claims**

1. Ultrasonic imaging apparatus operating according to the impulse-echo method, particularly for medical diagnostics, with an ultrasonic applicator for linear ultrasonic scanning of an examination subject and an image display device with a line sweep generator for reproducing echo impulses as lines, as well as an image generator for displacement of the lines as a function of the displacement of the ultrasonic beam in the subject, and a controllable electronic receiving gate having an output connected to said image display device for controlling the time interval in which echo impulses produced by the ultrasonic beam are displayed during each line sweep operation of the line sweep generator, wherein the improvement comprises means operatively coupled with said electronic receiving gate for operating said receiving gate alternately in the opened and blocking state in synchronism with the sweep pulses of the line sweep generator, control means operatively synchronized with the opened and blocking states of the electronic receiving gate for controlling the repetition rate of the transmitting cycles of the ultrasonic applicator and providing for establishing an independent operating frequency for the line sweep generator equal to a multiple of said repetition rate, and common timing means operatively coupled with said control means and providing for common adjustment of the timing of a series of transmitting pulses and providing for the

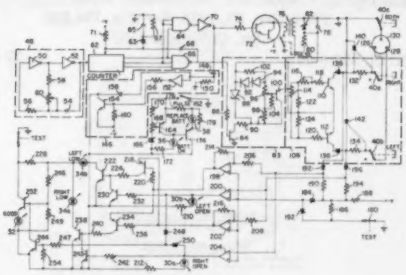


generation of said transmitting pulses only within respective blocking phases wherein the receiving gate is in the blocking state for echo impulses, said common timing means being adjustable for common adjustment of the moment of emission of each transmitting pulse within a respective blocking phase of the receiving gate thereby to provide a common adjustment of the depth location along the respective scanning paths being displayed on the image display device without alteration of the timing of the line sweep generator.

4,174,706
MANDIBLE STIMULATOR

Bernard Jankelson, 1451 Medical-Dental Bldg., Seattle, Wash. 98101, and John C. Radke, Seattle, Wash., assignors to Bernard Jankelson, Seattle, Wash.

Filed Jun. 27, 1977, Ser. No. 810,507
Int. Cl.² A61B *5/05*; A61N *1/36*
U.S. Cl. 128—741 **7 Claims**



1. A mandible stimulator for providing controlled electrical stimulation of the multiplicity of muscles innervated by the fifth and seventh cranial nerves, comprising:

a power source;

output means having right, left and common outputs, said output means including a right electrode connected to said right output, a left electrode connected to said left output and a dispersal electrode connected to said common output, said output means being adapted to form a right electrode circuit through the body of a patient between the right side of said patient's face and said dispersal electrode and a left electrode circuit through the body of said patient between the left side of said patient's face and said dispersal electrode;

amplitude control means for selecting the intensity of said electrical stimulation;

constant current pulsing means connected to said power source for periodically generating a right stimulus pulse between said right and common outputs, and a left stimulus pulse between said left and common outputs, said right and left stimulus pulses producing currents in said right and left electrode circuits, respectively, which are a constant value corresponding to the intensity selected by said amplitude control means such that the electrical stimulation of said muscles is unaffected by variations in electrode circuit resistance; and

electrode circuit testing means for measuring the conductance of said electrode circuits and providing a visual indication of the condition thereof, said testing means comprising right and left circuit conductance sensing means for generating right and left conductance signals indicative of the conductance in said right and left electrode circuits, respectively;

first comparator mens receiving said right and left conductance signals for illuminating a right open circuit indicating lamp and a left open circuit indicating lamp responsive to the conductance in said right and left electrode circuits, respectively, being less than a first predetermined value; and

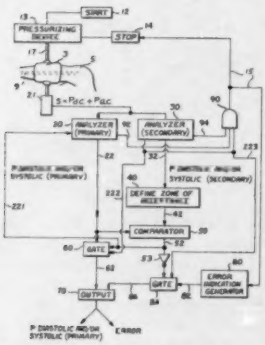
second comparator means receiving said right and left conductance signals for illuminating a right circuit low conductance indicating lamp responsive to the conductance of said right electrode circuit being less than the conductance of said left electrode circuit by a second predetermined value, and for illuminating a left circuit low conductance indicating lamp responsive to the conductance of said left electrode circuit being less than the conductance of said right electrode circuit by said second predetermined value thereby providing a visual indication of circuit unbalance.

4,174,707

APPARATUS AND PROCESS FOR ANTIFACT REJECTION THROUGH CROSS CORRELATION IN SPHYGMOMETRY

William T. Link, Berkeley; Jerry D. Haney, Sunnyvale, and William D. Jansen, Palo Alto, all of Calif., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 27, 1976, Ser. No. 754,200
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—681 **22 Claims**



1. An apparatus for producing information indicative of the physical condition of a living test subject comprising:

means for applying a selectively changeable pressure to the test subject adjacent a blood vessel and means for measuring a fluctuating quantity proportional to a sum, said sum comprising a time dependent fluctuating component representative of the pulsatile pressure within the blood vessel, plus the selectively changeable pressure applied externally adjacent the blood vessel;

first means responsive to said quantity in a first analytical manner for providing at least one primary signal tentatively representative of the changeable pressure applied to the living test subject;

second means responsive to said quantity in a second analytical manner different from said first analytical manner for defining at least one respective zone-of-acceptance expressed in terms of a corresponding representation of said changeable applied pressure; and

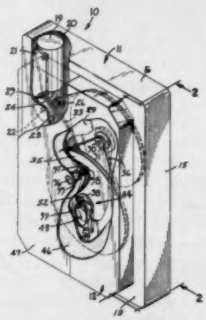
means for comparing a said primary signal with a respective said zone of acceptance and producing an output of said primary signal as being representative of the physical condition of the living test subject only if said primary signal is within said respective zone-of-acceptance.

4,174,708

BACK MASSAGER

Harry A. Coffin, 2811 Stevens Ave. South, Apartment 5C, Minneapolis, Minn. 55407

Filed Oct. 31, 1977, Ser. No. 846,996
Int. Cl.[2] A61H *7/00*
U.S. Cl. 128—49 **7 Claims**



1. A massaging unit, comprising, in combination:

a massaging applicator;

a base frame;

means for mounting said applicator for pivotal movement with respect to said base frame;

drive means carried by said base frame for imparting angular oscillatory motion to said massaging applicator in a single plane about said mounting means,

said massage unit including means between said base frame and said massaging applicator for limiting deviation of said massaging applicator from the oscillating plane,

said means for limiting said deviation including rollers carried by one of said massaging applicator and said base frame, engaging rails carried by the other of said massaging applicator and said base frame,

at least one of said rails including a plurality of ridges extending transverse to the path of one of said rollers.

4,174,709

EXTENSIBLE SPLINT

Richard H. Maddux, P.O. Box 231, Whitefish, Mont. 59937

Filed Dec. 20, 1977, Ser. No. 862,574
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—85 **3 Claims**

1. An extensible splint for human limbs, comprising, in combination:

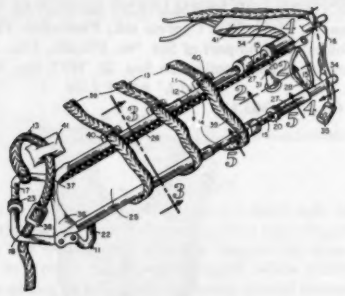
a compound peripheral frame having spaced elongate, articulating side rods with associated mechanical means for adjustable extension, comprising

the interconnecting portions of the side rods formed so that one slidably fits within the other; and

the smaller inter-fitting end portion being threaded and carrying a threadedly engaged adjustment nut to cause extension of the larger side rod portion relative to the other smaller portion responsive to motion of the nut, said articulating side rods interconnected in inner and outer end parts by inner and outer cross members to form a peripheral splint frame, said outer cross member being compound to allow lateral adjustment of the outer portion of the splint frame and having

two interconnecting portions formed so that one slidably fits within the other; and

the smaller inter-fitting portion being threaded and carrying a threadedly engaged adjustment nut to cause motion of the larger inter-fitting portion relative the smaller portion responsive to motion of the nut;



an adjustable fastening strap carried by the inner end portion of the peripheral frame to cooperate with the inner cross member to fasten therebetween a proximal part of a limb to be supported;

an outer support strap extending between the outer end parts of the peripheral frame and an adjustable outer fastening strap extending between those same end parts and over the outer support strap to cooperate therewith to fasten a distal portion of a limb to be supported therebetween; and

fastening means carried by the side rods of the peripheral frame to releasably fasten a human limb between the side rods.

4,174,710

CONNECTION BETWEEN TWO DIFFERENT PARTS OF A PERSON'S PROTECTIVE COVERING

Klaus Pampuch, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

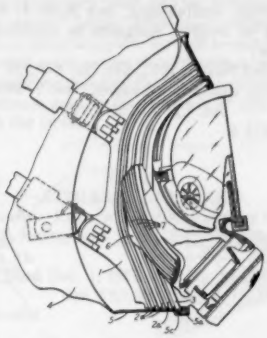
Filed Apr. 26, 1978, Ser. No. 900,252

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718864

Int. Cl.[2] **A62B** *7/00*

U.S. Cl. 128—142.7 **7 Claims**

1. A connection between two parts of a flexible protective covering for a person, with one of said parts having an opening therein facing the other part, said connection comprising an elastic band having one edge secured to said one part around said opening, the band extending away from said one part and surrounding a portion of the other part, the free edge of said band being thickened relative to the adjoining portion thereof and provided with a continuous groove in its inner surface extending around said thickened portion, the outer surface of the portion of said other part surrounded by the band being provided with surrounding laterally spaced ribs including one



rib projecting into said groove and holding said two parts of said protective covering together.

4,174,711

FIRE RESISTANT ENCLOSURE

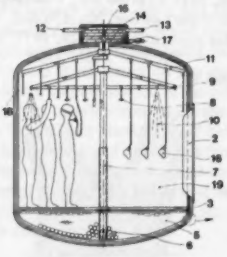
Oliver Laing; Nikolaus Laing, and Ingeborg Laing, all of Hofener Weg 35-37, D 7148 Remseck 2, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 843,157

Claims priority, application Austria, Oct. 19, 1976, 147762/76; Fed. Rep. of Germany, Feb. 17, 1977, 2706797; Feb. 17, 1977, 2706798

Int. Cl.[2] **A62B** *7/00;* **E04C** *2/00*

U.S. Cl. 128—145 R **13 Claims**



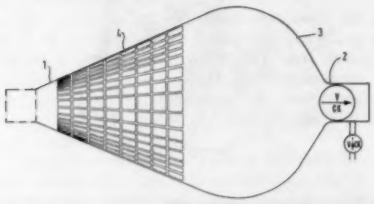
1. A container defining a shelter for persons having a wall which is heat insulating and protective against fire to prevent the interior of the container from exceeding a predetermined maximum temperature, said predetermined maximum temperature being equal to the physiologically acceptable temperatures of persons within the container, wherein the outer portion of the wall comprises at least one heat insulating layer and at least one other layer adjacent and inwardly of said heat insulating layer, said at least one other layer having hollow bodies of large area which are filled with a meltable crystalline substance whose melting point is below said predetermined maximum temperature and whose temperature of crystallization lies considerably below said melting point.

4,174,712

DEVICE FOR USE WITH MEDICINAL INHALATION DEVICES

Nils F. E. Morén, Staffanstorp, and Kjell I. L. Wetterlin, Sandby, both of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

Filed Nov. 7, 1977, Ser. No. 849,257
Claims priority, application Sweden, Nov. 9, 1976, 7612448
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—173 R 4 Claims



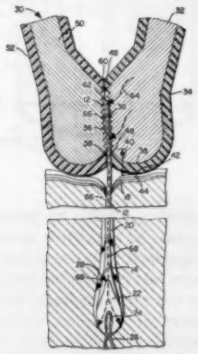
1. A device for use with a medicinal inhalation device for generating and enclosing a delimited aerosol mist, the device comprising a chamber which is rotationally symmetrical about an axis and has opposed ends, an opening at one said end to be connected with a spray nozzle, and a mouthpiece at the other said end, said opening and mouthpiece having axes aligned with said axis, the chamber having a first part adjacent the opening and a second part adjacent the mouthpiece, said first part being conical and divergent away from the opening, said second part converging towards the mouthpiece, orifices being provided in said first part only, said orifices comprising 1–50% of the total surface area of the chamber, the total internal volume of the chamber being between 0.5 and 2.0 liters, the total length of the chamber being between 10 and 40 cm, the maximum diameter of the chamber being between 25 and 80% of its length, and the part of the chamber which has the maximum diameter being closer to the mouthpiece than to the opening.

4,174,713

DEVICE FOR PERMANENT REMOVAL OF HAIR

Thomas L. Mehl, 5821 Cypress Rd., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 670,682, Mar. 26, 1976, abandoned. This application Sep. 28, 1977, Ser. No. 837,172
Int. Cl.[2] A61N *3/04*
U.S. Cl. 128—303.13 41 Claims



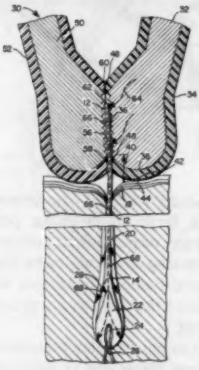
1. A hair removal device, comprising:
(a) two opposed relatively movable support members having lower end sections which are in position to engage each other
(b) each of the end sections having a substantially flat hair engaging surface adjacent and spaced from the periphery thereof
(c) at least one of the hair engaging surfaces being made of conductive material
(d) a high frequency energy wave source which is electrically connected to said one conductive hair engaging surface, and
(e) high frequency electrical wave insulative material bordering each of the hair engaging surfaces and disposed between the periphery thereof and the periphery of the end section which is of sufficient thickness to restrict lateral radiation from the hair engaging surfaces outwardly to the periphery of the end sections.

4,174,714

METHOD FOR PERMANENT REMOVAL OF HAIR

Thomas L. Mehl, 5821 Cypress Rd., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 670,682, Mar. 26, 1976, abandoned. This application Sep. 28, 1977, Ser. No. 837,164
Int. Cl.[2] A61N *3/04*
U.S. Cl. 128—303.13 24 Claims



1. The method of removing hair and inhibiting future regrowth comprising the steps of:
(a) reducing hair length such that the end thereof is relatively close to the skin
(b) grasping the reduced length of hair between small area conductive hair engaging surfaces each one of which are mounted on one of two relatively movable arms which are covered with high frequency electrical insulation at the ends thereof, the hair engaging surfaces being adjacent to but spaced from the periphery of the insulated end portions
(c) moving the insulated end portions of the arms into engagement with the skin
(d) applying high frequency electrical waves to one of the small area conductive hair engaging surfaces, and
(e) holding the hair engaging surfaces in firm engagement in position against the hair while applying the high frequency electrical waves until the hair releases.

4,174,715

MULTI-PRONGED LAPAROSCOPY FORCEPS

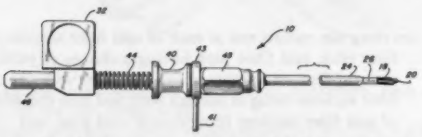
Harrith M. Hasson, 345 Fullerton Pkwy., Chicago, Ill. 60614

Filed Mar. 28, 1977, Ser. No. 781,678
Int. Cl.[2] A61B *17/28*
U.S. Cl. 128—321 11 Claims

1. An improved forceps for use with a laparoscopy instrument of the type that includes elongated tubular guide means having a forward end, finger grip means secured to said guide means distally from said forward end, elongated stem means having a portion thereof slidable in said tubular guide means,

and a thumb-operated actuator connected to said stem means for selectively moving said stem means longitudinally along said tubular guide means responsive to movement of the thumb-operated actuator toward and away from the finger grip means;

said improved forceps including a tubular sleeve as the forward portion of said tubular guide means, the elongated stem having a forward prong end arranged to move within the tubular sleeve toward and away from the forward end of said sleeve but with said forward prong end always positioned rearwardly of the forward end of the tubular sleeve, at least three elongated flexible forcep arms of resilient steel each having a base end thereof secured to the forward prong end of the elongated stem so that a portion of each forceps arm is at all times telescoped within the forwardmost portion of the tubular sleeve, each forcep arm being of a different length and having an inturned finger at the distal end thereof constructed and



arranged so that when said fingers at the distal ends of the forcep arms are clustered closest together each finger lies adjacent and overlapping adjacent fingers but does not contact any other finger, said fingers when clustered closest together and overlapping being spaced forwardly of the forward end of the tubular sleeve, each forcep arm being biased to normally spring outwardly away from the other forcep arms when the elongated stem is projected forwardly, but being cammed by the extended end of the tubular sleeve to draw the distal ends of the forcep arms toward a clustered relationship when the elongated stem is moved rearwardly, and spring means operative associated with the finger grip means and thumb-operated actuator for normally biasing said elements apart and to tend to move the elongated stem rearwardly, the finger grip means on the rearward side thereof being recessed, and said spring means being an elongated coil spring one end of which enters the recessed rearward side of the finger grip means.

4,174,716

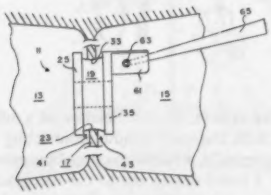
MYRINGOTOMY TUBE

Harry T. Treace, Forest Hill, Tenn., assignor to Richards Manufacturing Co., Inc., Memphis, Tenn.

Filed Dec. 19, 1977, Ser. No. 861,716

Int. Cl.[2] A61M *27/00*

U.S. Cl. 128—350 R **14 Claims**



1. A myringotomy tube for providing ventilation and drainage of the middle ear through the external auditory canal, said myringotomy tube comprising a principal member having a passageway provided therein for communicating the middle ear with the external auditory canal subsequent to said principal member having been inserted through a surgical incision applied to the tympanic membrane, an inner flange member integrally combined with said principal member and being disposed at the innermost end thereof for precluding at least in part the inimical natural tendency of the healing incision to cause said myringotomy tube to be spontaneously extruded into the external auditory canal, and the external surface of said inner flange member being substantially elliptical shaped in cross-section as taken on a plane normal to said passageway for facilitating initial engagement thereof with a lip portion of the tympanic membrane defining the incision provided therein to establish optimum ease in the insertion of said myringotomy tube through the incision.

4,174,717

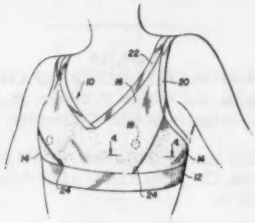
ATHLETIC BRASSIERE

Hinda S. Schreiber; Eugenie Z. Lindahl, both of Burlington, Vt., and Polly P. Smith, New York, N.Y., assignors to SLS, Inc., Burlington, Vt.

Filed Dec. 1, 1978, Ser. No. 965,381

Int. Cl.[2] A41C *3/00*

U.S. Cl. 128—494 **9 Claims**



1. An athletic brassiere, comprising:

at least one front panel disposed to cover the front of both breasts when worn, without seams in the vicinity of the nipples, said panel being substantially flat and not shaped to uplift the individual breasts when worn;

at least one side panel sewn to each side of said front panel such that the stitches of the seams are on the exterior surface of the panel away from the wearer when worn;

a wide elastic rib band connected to the bottom of said front and side panels and extending continuously around the body when worn, the front portion of said band being on the front of the wearer when worn and the back portion being on the back of the wearer when worn; and

two elastic straps, one of said straps being connected at one end thereof to said front panel on the right side of the wearer when worn and connected at the other end thereof to the back portion of said rib band on the left side of the wearer when worn, and the other of said straps being connected at one end thereof to said left front panel on the left side of the wearer when worn and connected at the other end thereof to the back portion of said rib band on the right side of the wearer when worn such that said straps cross in the back when worn.

4,174,718

RUB-THRESHING MACHINE

Berend van de Weerd, Bennekom, Netherlands, assignor to Ter Borg & Mensinga's Machinefabriek N.V., Appingedam, Netherlands

Filed Nov. 17, 1977, Ser. No. 852,485

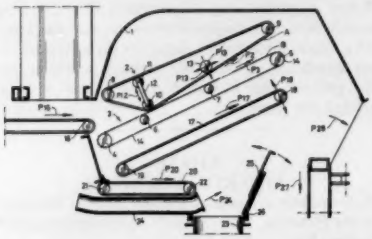
Claims priority, application Netherlands, Nov. 25, 1976, 7613173

Int. Cl.[2] A01F *12/18*

U.S. Cl. 130—30 J **12 Claims**

1. Rub-threshing machine for threshing grains and pulse comprising at least two endless belts which have been passed in loop-shape around guiding- and driving rollers, are driven at different speeds and are in mutual contact over a part of their surface length so as to thresh material at that location which is

supplied to the belts, wherein at least the lower threshing belt is constructed of rod shaped elements, transverse with respect to the belt's direction of travel, and interconnected at their



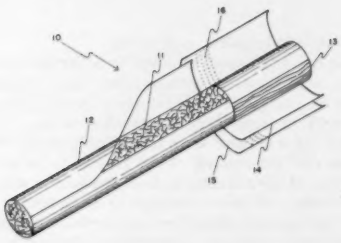
ends in such manner that the rods obtain a mutual spacing which is selected, according to the nature and fruit size of each sort of crop to be processed, such that the fruit can fall through the rods.

4,174,719

MICROPERFORATED FILTER TIP CIGARETTE

Richard H. Martin, and William F. Owens, Jr., both of Pisgah Forest, N.C., assignors to Olin Corporation, Pisgah Forest, N.C.

Filed Jun. 29, 1977, Ser. No. 811,046
Int. Cl.[2] A24B *15/02;* A24D *1/04*
U.S. Cl. 131—10 A **6 Claims**



1. A ventilated filter tip cigarette comprising in combination a filter enclosed by a uniformly porous wrapper having a Filtrona air permeability within the range of from 300 to 4000 units, a tipping envelope enclosing said enclosed filter containing a zone of microperforations, the size of each of said perforations being less than 0.01 mm^2 in open hole area, said wrapper and envelope adhered together over areas of their contiguous surfaces except in the area of the microperforations to permit ambient air to flow through the tipping perforations and porous wrapper, whereby the carbon monoxide yield in the smoke from the cigarette is selectively reduced over other smoke components resulting in a carbon monoxide to nicotine selectivity ratio of at least 3.

4,174,720

GLUE TRANSFER APPARATUS FOR CIGARETTE FILTERS

Floyd V. Hall, Durham, N.C., assignor to Liggett Group Inc., Durham, N.C.

Filed Apr. 26, 1977, Ser. No. 790,949
Int. Cl.[2] A24C *5/50, 5/52, 1/04*
U.S. Cl. 131—90 **8 Claims**

1. A method of forming a multi-sectional particulate-containing filter, said method comprising the steps of

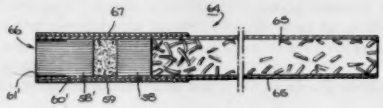
moving a stream of plug wrap paper through a predetermined path;

placing increments of glue on one side of the stream of plug wrap paper at predetermined spacings from each other;

moving a sequence of spaced apart filter sections onto the moving stream of plug wrap paper with alternate filter sections being disposed on the increments of glue;

subsequently depositing charges of particulate filter material onto the moving stream of plug wrap paper between adjacent filter sections;

thereafter wrapping the moving stream of plug wrap paper about the filter sections and charges of particulate filter material to form an endless rod;



severing the endless rod at each of said filter sections into a filter plug, said filter plug having a charge of particulate material flanked by severed filter sections with one of said filter sections being in contact with said glue and with one of said filter sections being free of said glue, and

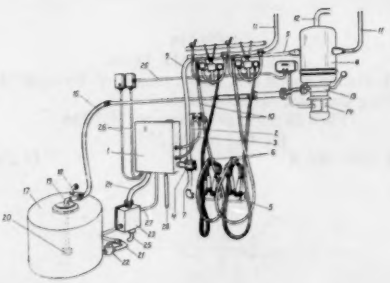
thereafter moving said filter section being free of glue towards said charge of particulate filter material and said filter section being in contact with said glue to compact the charge of particulate material.

4,174,721

APPARATUS FOR CLEANING MILKING SYSTEMS

Gunther R. Wuchse, Vienna, Austria, assignor to Alfa-Laval AB, Tumba, Sweden

Filed May 20, 1977, Ser. No. 798,941
Claims priority, application Sweden, May 21, 1976, 7605772
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—58 R **5 Claims**

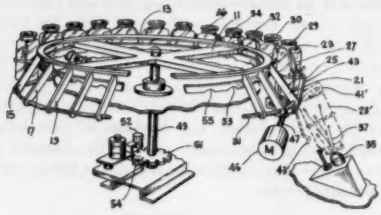


1. In a milking system, the combination of a milking means, a receptacle, a milk transport conduit connecting said milking means to the receptacle, a vacuum source communicating with the receptacle, a pump connected to the receptacle, a storage tank adapted to receive milk from the receptacle by way of said pump, said tank having a drain outlet, a sprayer for cleaning liquid opening into said tank, a control unit having a programmer for controlling a cleaning procedure, the control unit being connectable to said receptacle through said milk transport conduit, first duct means for connecting the pump selectively to either the control unit or said sprayer, discharge means, and second duct means for connecting said drain outlet selectively to either said receptacle or said discharge means.

4,174,722
CLEANING APPARATUS FOR SAMPLE CONTAINERS IN A QUEUE

Richard P. Fleenor, and Henry W. Cassady, Jr., both of Santa Cruz, Calif., assignors to Manning Environmental Corp., Santa Cruz, Calif.

Filed Jun. 23, 1978, Ser. No. 918,470
Int. Cl.[2] B08B *3/02*; B67C *1/00*
U.S. Cl. 134—62 9 Claims



6. An improved apparatus for washing containers, such as bottles or the like, comprising,

a hinged container holder having means for securing a container therein with a container opening facing generally upwardly,

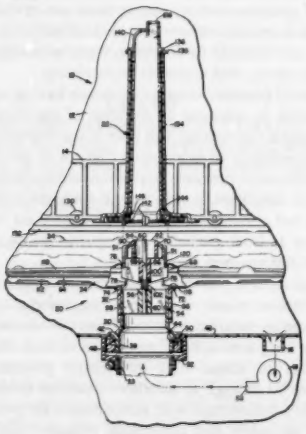
a wash station having a nozzle means disposed beneath said holder for directing a washing fluid stream in a predetermined upward trajectory, and

container inverting means for causing holder rotation about said hinge to a generally upside down container position, bringing a holder and the opening of a container secured therein into alignment with the fluid stream trajectory of said nozzle means and later for causing holder rotation about said hinge, restoring said holder to its initial position, said container inverting means comprising a pivotally mounted hook mounted near said wash station for rotatably engaging a holder and causing holder rotation about said hinge.

4,174,723
DISHWASHER WATER DISTRIBUTION APPARATUS

Olan L. Long, Grandview Heights, Ohio, assignor to White-Westinghouse Corporation, Pittsburgh, Pa.

Filed Oct. 16, 1978, Ser. No. 951,611
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—144 20 Claims

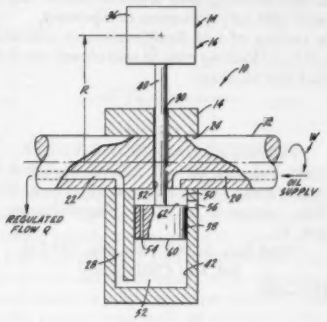


1. For use in a dishwasher, a wash arm installation comprising: a bladed, hollow wash arm with spray and reaction orifices; a distributor non-rotatably mounting said wash arm; a water inlet and distributor support unit adapted to be fixedly secured in the dishwasher; cooperating bearing means on said support unit and said distributor enabling rotation and axial shift and vertical removal of said distributor relative to said support unit; and clip means integral with said distributor structurally cooperating with said wash arm to releasably and non-rotatably secure said wash arm to said distributor.

4,174,724
FLOW VALVE

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 11, 1977, Ser. No. 814,353
Int. Cl.[2] G05D *13/08*
U.S. Cl. 137—56 3 Claims

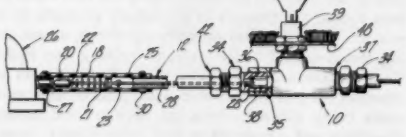


1. A flow valve comprising a rotating shaft, a valve body mounted on said shaft for rotation therewith, a valve member mounted for radial movement with respect to said body and said shaft, said valve member having a weighted head and a pressure differential head, a fluid cavity in which said pressure differential head is mounted, said pressure differential head dividing said cavity into a pair of chambers, an orifice between said chambers, a fluid inlet supplying fluid under pressure to one of said chambers, and a fluid outlet connected to the other of said chambers, in which said other chamber is radially outward of said one chamber, whereby the flow of fluid through said orifice and to said outlet will be proportional to the speed of rotation of said shaft.

4,174,725
ANTITAMPER ARRANGEMENT FOR A LOCKING FUEL SHUTOFF VALVE

Samuel LaPere, Wyandotte, Mich., assignor to Allen LaPere

Filed Jul. 18, 1977, Ser. No. 816,600
Int. Cl.[2] B60R *25/04*; F16K *17/36*, *35/06*
U.S. Cl. 137—68 R 11 Claims



1. An antitamper device for use in conjunction with an automotive vehicle fuel line shutoff valve, the arrangement comprising:

a blocking plug disposed within the fuel line movable between an open and closed position;

a resilient spring element engaged at one end with said blocking plug having the other end positioned within the fuel line;

means releasably restraining said blocking plug in said open position with said spring element compressed in said fuel line;

an element located in said fuel line at said closed position of said blocking plug cooperating with said plug to effect a fuel line blockage upon release of said means restraining said blocking plug and movement of said blocking plug to said closed position under urging of said compressed spring element;

said means releasably restraining said blocking plug element including a flexible element and also including means connecting said flexible element to said blocking plug, said flexible element extending through said fuel line, said means releasably restraining said blocking plug element including means anchoring one end of said flexible element proximate said fuel line shutoff valve in a position in which said blocking plug is positioned in said open position with said spring element compressed;

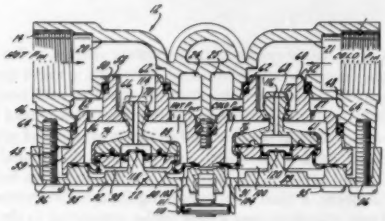
whereby cutting of said flexible element will allow movement of said blocking plug to said closed position to effect said fuel line blockage.

4,174,726

PRESSURE BALANCING VALVE

Don C. Arnold, Palatine; Julio D. Silletti, Rockford; Richard L. Ritzenthaler, Alden, all of Ill., and Thomas J. Wilcox, East Troy, Wis., assignors to Elkay Manufacturing Company, Broadview, Ill.

Filed Nov. 5, 1976, Ser. No. 739,082
Int. Cl.[2] C05D *11/00*
U.S. Cl. 137—100 **5 Claims**



1. A pressure equalizing valve means comprising:

housing means providing hot and cold water inlet members,

valve means in each said inlet member,

a water chamber within said housing means associated with each said valve means and inlet member, each said valve means controlling flow of water received at one of said inlet members at supply pressure and regulating the pressure in the associated water chamber,

an outlet member for each water chamber,

said housing means having pressure equalizing means operated by the water pressure in both said water chambers and connected to operate each said valve means responsive to any pressure differential between said water chambers caused by changes in the supply pressure in either said inlet member, said pressure equalizing means including means in said housing means defining two hydraulic fluid chambers associated respectively with said water chambers, a pair of movable walls, one of said movable walls being mounted between each of said associated chambers and connected to said valve means, means including a restricted fluid passage between said hydraulic fluid chambers for transmitting hydraulically the movement of one movable wall, responsive to a change in pressure in the associated water chamber, to the other movable wall and inversely shifting the position of both valve means, to change the water chamber pressure regulated by each said valve means, with the magnitude and sense of the change reducing any such differential to zero and equalizing the pressures in said water chambers thereby to provide equal pressures from said outlet passage means with unequal water supply pressures, said two hydraulic fluid chambers and fluid passage between being sealed from the water supply and having a separate body of hydraulic fluid therein,

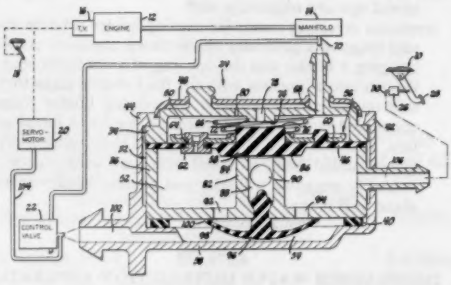
said valve means in each said inlet member comprising a valve seat, a valve member movable relative to each said valve seat, an element connecting each said valve member to one of said movable walls, and means for balancing each said valve member against changes in water supply pressure comprising a balancing chamber formed in said one movable wall, and passage means through said connecting element section between said balancing chamber and the inlet member, the diameter of said balancing chamber being substantially equal to the diameter of the valve seat so that the effective area of the valve member is substantially zero.

4,174,727

VACUUM LATCHING DUMP VALVE

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 8, 1978, Ser. No. 940,639
Int. Cl.[2] F02M *37/00*
U.S. Cl. 137—111 **2 Claims**



1. A vacuum dump latch and release valve assembly having a port adapted to be connected to a vacuum actuated member required to be selectively dumped to atmospheric pressure, said assembly also having means adapted to be connected to a source of vacuum and to atmospheric air pressure and to a dump valve openable to connect said assembly to atmospheric pressure and closable to disconnect said assembly from atmospheric pressure, said assembly comprising:

differential pressure responsive means having valve portions movable in response to opening of the dump valve to a condition connecting said port to atmospheric air pressure independently of subsequent closure of the dump valve;

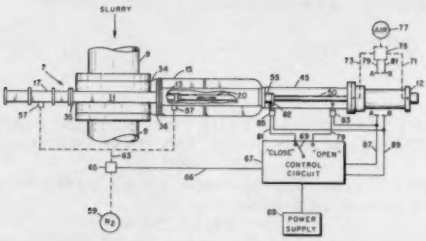
said differential pressure responsive means being maintained in said condition in response to said atmospheric air pressure and at least one of said valve portions being so maintained at least partially in response to vacuum pressure from the vacuum source;

said one of said valve portions of said differential pressure responsive means also being responsive to a sufficient change in vacuum pressure from the vacuum source approaching atmospheric air pressure, with the dump valve closed, to cause said differential pressure responsive means to change to another condition to close said port against connection with atmospheric air pressure through said assembly, said differential pressure responsive means remaining in said another condition until said dump valve is again opened.

4,174,728
SLIDING-GATE VALVE

George B. Usnick, Birmingham; Gene T. Ward; Henry O. Blair, both of Sylacauga, all of Ala.; James W. Roberts, Charlotte, N.C., and Terry N. Warner, Wilsonville, Ala., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 14, 1977, Ser. No. 851,330
Int. Cl.[2] F16K 3/20
U.S. Cl. 137—240 6 Claims



1. A valve assembly comprising:

a valve body defining a circular bore extending about a first axis and also defining opposed passages intersecting said bore and extending along a second axis substantially normal to the first;

an annular seat assembly coaxially fitted in said bore and defining a flow channel, said assembly comprising rings disposed along the first axis, said rings including first and second seat rings cooperatively defining an annular gap communicating with said passages to form a guideway extending along the second axis, the first seat ring being slidably and sealably engaged with said body, the second seat ring being supported by said body in an axially fixed position; and a third ring disposed outwardly of and bearing on the first seat ring, the third ring being fixed to said body against axial movement therein;

a valve casing supporting said body and including chambers extending in opposite directions from said body along the second axis, said chambers communicating respectively with said passages and being sealed from atmosphere;

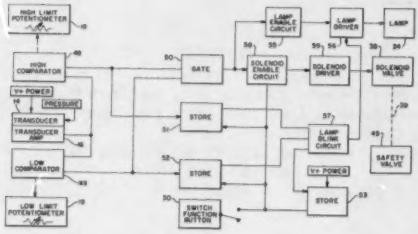
a plate-type gate mounted for reciprocation in said guideway between positions where a portion of said gate closes said channel and where a generally circular aperture in said gate is in register with said channel, the third ring being cut away to receive slidable inserts for advancement toward said channel to displace the first seat ring toward said gate; and means respectively extending into said chambers for introducing therein purge gas at a pressure exceeding the pressure within said channel.

4,174,729
PRESSURE SENSING SAFETY DEVICE

James T. Roark, Carrollton, and Oliver W. McCracken, Richardson, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 25, 1977, Ser. No. 772,007
Int. Cl.[2] G05D 16/20
U.S. Cl. 137—487.5 6 Claims

1. A safety device for monitoring and controlling the pressure in a pressure vessel comprising, in combination, a pilot device in operative engagement with the pressure vessel, a transducer mounted on the pilot device and communicating with the pressure vessel to sense the magnitude of the pressure within the pressure vessel, a source of power for the transducer, an amplifier electrically connected with the transducer to amplify electrical signals received therefrom, a first potentiometer adjustable to provide a first reference voltage corresponding to an upper limit of pressure desired in the pressure vessel, a second potentiometer adjustable to provide a second reference voltage corresponding to a lower limit of pressure desired in the pressure vessel, a first comparator circuit electrically connected with the first potentiometer and the transducer amplifier to compare the signals received therefrom and to provide a signal representing the magnitude of the pressure in the pressure vessel, a second comparator circuit electrically connected with the second potentiometer and the transducer to compare the signals received therefrom and to provide a signal representing the magnitude of the pressure in the pressure vessel, a gate receiving the output signal from the comparator circuits, a memory circuit for storing the signals received from the comparator circuits through the gate, a visual indicator electrically connected to the gate to receive the output of the comparator circuits for providing a visual display of the

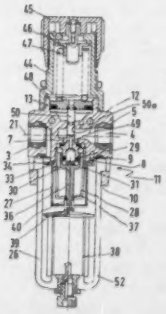


magnitude of the pressure in the pressure vessel; and including a circuit for controlling the operation of the visual display, the circuit being electrically connected to the memory circuit and the gate, a manually operable switch electrically connected to the memory circuit and the control circuit whereby operation of the manual switch in a first mode permits the visual display to indicate the present magnitude of pressure in the pressure vessel and operation of the switch in a second mode permits the visual display to indicate a prior magnitude of pressure in the pressure vessel when the signals stored in the memory circuit correspond to the magnitude of pressure above or below the predetermined desired levels or pressure in the pressure vessel.

4,174,730
HOUSING FOR AIR SERVICE UNITS

Roland Heilmann, Neuenhaus, Fed. Rep. of Germany, assignor to J. Lorch Gessellschaft & Co. KG, Waldenbuch, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,929
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1977, 7622478
Int. Cl.[2] E03B 7/07
U.S. Cl. 137—271 3 Claims



1. A housing capable of being interchanged for use with air service units such as a water separator, a pressure regulating

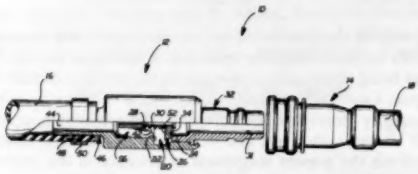
valve or a filter/pressure reducer, comprising, a body member in the form of a cube having first, second and third pairs of opposing sidewalls with each said pair being perpendicularly related to the other pairs, said body member having a flow passage with an inlet and an outlet thereof disposed co-axially and being respectively located in said first opposing sidewalls, a receiving chamber and a valve seat located in the path of said passage, said body member having a bore for guiding a valve body capable of engaging the valve seat for controlling the flow through said passage, a bayonet connection union and a screw connection union respectively located on said second opposing sidewalls, a snap connection member recessed within said cube and lying adjacent said bayonet connection and said receiving chamber, and a guide cylinder located on the other of said second opposing sidewalls adjacent said screw connection union.

4,174,731

EXCESS FLOW LIMITING VALVE

Malcolm B. Sturgis, St. Louis, Mo., and Harry H. Hammond, North Royalton, Ohio, assignors to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Nov. 21, 1977, Ser. No. 853,194
Int. Cl.[2] F16K *17/26*
U.S. Cl. 137—489 **7 Claims**



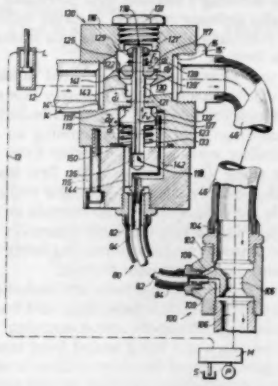
1. A plug assembly for use in association with a socket assembly to connect a pair of conduits in fluid communication with each other, said plug assembly comprising a plug body at least partially defining a valve chamber, said valve chamber having a first valve seat through which fluid normally flows into said valve chamber and a second valve seat through which fluid normally flows out of said valve chamber, said first valve seat being spaced apart from and extending generally parallel to said second valve seat, a longitudinally extending support member disposed in said valve chamber and fixedly connected with said plug body, a valve member slidably mounted on said support member and disposed in said valve chamber, said valve member being movable between a first closed position, an open position, and a second closed position, said valve member in said first closed position engaging said first valve seat and at least partially blocking fluid flow through said first valve seat, said valve member in said second closed position being spaced from said first valve seat and disposed in engagement with said second valve seat and at least partially blocking fluid flow through said second valve seat, and said valve member in said open position being disposed between and spaced apart from said first and said second valve seats to enable fluid to flow from said first valve seat around said valve member and through said second valve seat, spring means for urging said valve member toward said first closed position, said valve member being movable from said first closed position to said open position against the influence of said spring means, said valve member being movable from said open position to said second closed position against the influence of said spring means and under the influence of an excessive flow of fluid through said valve chamber to at least partially block the excessive flow of fluid, said valve member including first surface means for defining a passage extending axially through said valve member, said passage extending axially through said valve member from a first major side of said valve member to a second major side of said valve member at a location which is disposed inwardly of said first valve seat when said valve member is in said first closed position, said valve member further including second surface means defining a central passage extending through said valve member, said second surface means being disposed in sliding, abutting engagement with said support member and movable along said support member as said valve member moves between said first and second closed positions, said support member having an end portion extending through one of said valve seats to enable said valve member to move between said first and second closed positions and having a head connected with said end portion for limiting movement of said valve member relative to said support member during assembly of said plug assembly.

4,174,732

FLOW SENSING VALVE FOR PROTECTING CONDUIT SYSTEMS AGAINST UNINTENTIONAL PRESSURE CHANGES

Lennart W. Freese, Järfälla, Sweden, assignor to SMT-Pullmax AB, Gothenburg, Sweden

Filed Jan. 16, 1978, Ser. No. 870,007
Claims priority, application Sweden, Jan. 17, 1977, 7700415
Int. Cl.[2] F16K *17/32*
U.S. Cl. 137—498 **6 Claims**

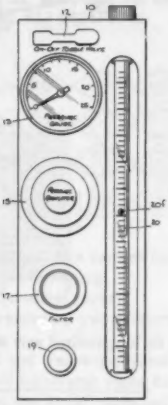


1. A valve arrangement for automatically stopping the flow of a medium through a conduit section on the occurrence of a rupture or leak in the section, the arrangement comprising a closing or blocking valve including a movable closure means mounted at the inlet of the conduit section, said valve normally being open and offering the medium flowing therethrough a resistance resulting in a first pressure drop (Δp_1) across the valve is response to the size of the flow, said first pressure drop being arranged to actuate the closure means for closure thereof; and a flow sensing means mounted at the outlet of the conduit section, including, for example, an orifice plate or venturi constriction known per se, between the inlet and outlet sides of which the medium flowing therethrough generates a second pressure drop (Δp_2) in response to the size of the flow, this second pressure drop being arranged to actuate the said closure means in the opposite direction to that of closure, the improvement wherein the closure means includes two parts, each movable in relation to the other and actuated by the said pressure drops (Δp_1, Δp_2), the first part consisting of a blocking body arranged for moving towards the closure position by the first pressure drop (Δp_1) across the blocking valve for blocking the flow through the valve when in said closure position, while the second part consists of a servo body arranged for actuation by the second pressure drop (Δp_2) across the flow sensing means to thereby in turn act on the blocking body to counteract its movement towards the closure position.

4,174,733
PROCESS GAS FLOW CONTROL MODULE

Paul G. Eidsmore, Saratoga, and Alva A. Eidsmore, Santa Cruz, both of Calif., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Sep. 19, 1977, Ser. No. 834,507
Int. Cl.[2] F16K *37/00*
U.S. Cl. 137—552 5 Claims



1. A module which integrates in a single block a process gas flow control system adapted to precisely meter the flow of gas fed into a utilization device, said module comprising:

A. a block formed by a body which is chemically-inert with respect to the gas being metered, said body having open cavities therein for nesting the components of the system and a network of internal bores therein that communicate with the cavities to intercouple the components; and

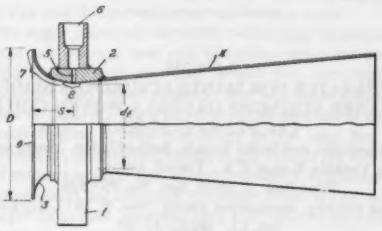
B. system components removably nested in said cavities and intercoupled by said network of internal bores, said components including an adjustable pressure-regulator to set the pressure of the gas received from an inlet fitting, an on-off toggle valve to control the passage of gas from said inlet fitting to said regulator, a gas filter interposed between the toggle valve and said regulator, a pressure gauge coupled to the regulator to indicate the set pressure, a metering valve to adjust the flow rate of the regulated gas from the regulator to an output fitting and a flowmeter of the variable area type interposed between the metering valve and the outlet fitting to indicate the flow rate, said flowmeter having a meter tube nested in one of said cavities and held in place by said outlet fitting which is removable to permit removal of said tube, said internal bores having stub extensions terminating in ports on the surface of the block and sealed by removable plugs to permit cleaning of the bores.

4,174,734
FLUID FLOW METERING TUBE WITH MINIMUM PRESSURE ENERGY LOSS

Allen C. Bradham, III, Milwaukee, Wis., assignor to First Wisconsin National Bank of Wisconsin, Milwaukee, Wis.

Filed Mar. 13, 1978, Ser. No. 886,000
Int. Cl.[2] F16D *1/02*
U.S. Cl. 138—39 3 Claims

1. In a full pipe primary element flow tube comprising an inlet section, a throat section and a recovery section, the improvement wherein the stream-defining internal contour of said inlet section is that which produces a constant rate of acceleration of flow of the fluid in flowing through said inlet section, the profile of said inlet section being defined by the following equation:



$$d_i = \sqrt{\frac{1}{\frac{1}{D^2} + \left[\frac{1}{d_f^2} - \frac{1}{D^2}\right]\sqrt{\frac{S_i}{S}}}}$$

wherein

D=section contour inlet diameter (essentially pipe diameter)

d_f=section contour outlet diameter (essentially throat diameter)

S=section contour length

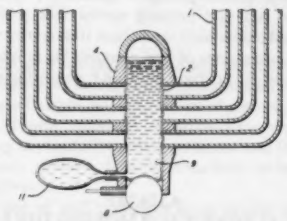
S_i=increment of contour length (distance from inlet of section contour)

d_i=diameter of contour at increment S_i.

4,174,735
METHOD OF TEMPORARILY SEALING OPEN ENDS OF FLUID CONDUITS TERMINATING IN A HEADER SPACE

Dirk M. Visbach, Rijswijk, Netherlands, assignor to B.V. Neratoom, The Hague, Netherlands

Continuation-in-part of Ser. No. 597,461, Jul. 21, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,206
Claims priority, application Netherlands, Dec. 31, 1975, 7515226
Int. Cl.[2] F28F *11/00*; F16L *55/18*
U.S. Cl. 138—97 9 Claims



1. A method of temporarily sealing vacuum-tight a multiplicity of elongated fluid transport conduits to permit detection of leaks in said conduits, said transport conduits having unobstructed open first ends terminating in a common header space, the method comprising:

completely filling the header space from a level below the lowest open first end to a level above the highest open first end of the multiplicity of fluid transport conduits with a sealing material in liquid form in sufficient quantity to cover the open first ends;

subsequently causing the sealing material to solidify, thereby sealing the first end of each transport means with said solidified sealing material;

reliquefying said sealing material after completing detection and repair of leaks in said conduits; and

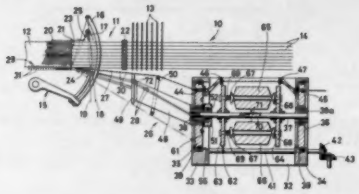
removing said reliquefied sealing material from the header space.

4,174,736

APPARATUS FOR MANUFACTURING A SLIDE FASTENER STRINGER HAVING A WOVEN COILED COUPLING ELEMENT

Kihei Takahashi, and Seiko Terada, both of Uozu, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 3, 1978, Ser. No. 957,556
Claims priority, application Japan, Nov. 9, 1977, 52/134363
Int. Cl.[2] D03D *41/00*
U.S. Cl. 139—35 **9 Claims**



1. An apparatus for manufacturing a slide fastener stringer including a stringer tape, woven of warp and weft threads, and a coiled fastener element woven into the stringer tape along a longitudinal edge thereof, comprising:

(a) means for weaving the stringer tape, said means including means for shedding warp threads and a filling carrier for inserting a weft thread through the warp shed;

(b) a mandrel for extending substantially along the warp threads, said filling carrier being reciprocable across said mandrel; and

(c) a rotor assembly for winding a monofilament in an orbital path to form the fastener element coiled around said mandrel and woven into the tape by the weft thread, said rotor assembly comprising a housing, a wheel rotatably mounted in said housing and having means for guiding the monofilament, a floating axle around which said wheel is rotatable, said mandrel being supported on said axle, a pair of first and second plungers operatively acting between said axle and said housing across said orbital path by which said axle is held at all times stationarily with respect to said housing, one of said plungers being retractable at a time out of said orbital path, and means for rotating said wheel.

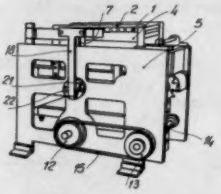
4,174,737

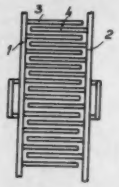
MECHANICAL DEVICE FOR MOVING THE LIFTERS OF THE WEAVING MACHINES

Benedetto Bobbio, Via Giotta, 8, Rovellasca (Como), Italy

Filed Mar. 23, 1978, Ser. No. 889,245
Claims priority, application Italy, Mar. 31, 1977, 21927 A/77
Int. Cl.[2] D03C *3/06*
U.S. Cl. 139—65 **5 Claims**

1. In a weaving machine, which comprises lifters, a mechanical device or assembly for moving, upwardly and downwardly, said lifters, which comprises two horizontal bars provided, at the respective adjacent sides, with a series of cantilevered parallel teeth inserted into one another and with vertical guides sliding in respective seats fixed to the side walls of the device; each horizontal bar being articulated to one end of a connecting rod which is at its opposite end eccentrically pivoted to a rotating disc, each horizontal bar being also fixedly connected to one end of a vertically extending bar, the free end of which slides in a guide provided on each side wall of the





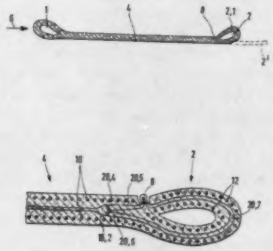
device and having its longitudinal axis slanted with a variable slant.

4,174,738

TUBULAR EDGED BELTING AND METHOD OF MAKING

Johann Berger; Josef Berger, both of Obere Schlosstrase 114, 7071 Alfdorf, Fed. Rep. of Germany, and Konstantin Papageorgion, Urbach, Fed. Rep. of Germany, assignors to Johann Berger and Josef Berger, both of Aldorf, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 900,009
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719382
Int. Cl.[2] D03D *3/00, 5/00*
U.S. Cl. 139—384 R **4 Claims**



1. A method of making belting on a ribbon band weaving machine having knitting means, said belting having a woven central portion and first and second tubular edge portions each on one edge of said central portion, comprising the steps of:

(a) forming the first tubular edge portion with warp and weft threads,

(b) first weaving the second tubular edge portion as a single layer fabric, having an outside edge,

(c) knitting a course defining a joint along the edge of said central portion and said outside edge with two loops of a tuck thread each having a head held by one pick loop of the weft thread and a neck held by the knitting course, and

(d) closing the second tubular edge portion by pulling the said one pick loop of the weft thread while feeding a

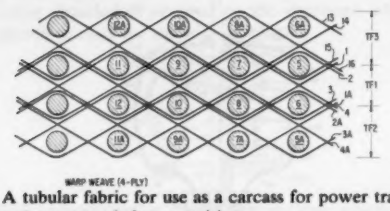
length of tuck thread more than sufficient to form said joint and correspondingly less weft thread.

4,174,739

TUBULAR FABRIC

Lawrence J. Rasero; John Pelchuck, Jr., both of Middletown, and Gordon H. Howard, Andover, all of Conn., assignors to Fenner America Ltd., Middletown, Conn.

Filed Feb. 21, 1978, Ser. No. 880,120
Int. Cl.[2] D03D 3/02
U.S. Cl. 139—388 **4 Claims**



1. A tubular fabric for use as a carcass for power transmission and conveyor belts comprising:

(a) a plurality of longitudinal yarns;

(b) a plurality of transverse yarns interwoven with said longitudinal yarns;

(c) said longitudinal and transverse yarns forming a warp weave wherein said transverse yarns form adjacent pairs having upper yarns and lower yarns and said longitudinal yarns pass above a first upper yarn of a first pair of transverse yarns, between a second upper yarn and a second lower yarn of a second pair of transverse yarns adjacent the first pair, below a third lower yarn of a third pair of transverse yarns adjacent the second pair, and between a fourth upper yarn and a fourth lower yarn of a fourth pair of transverse yarns adjacent the third pair; and

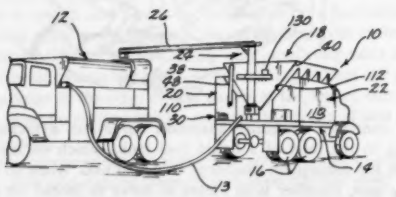
(d) said longitudinal yarns forming first, second, third and fourth substantially parallel planes; said transverse yarn forming fifth, sixth, seventh and eighth substantially parallel planes; said first and second planes binding said fifth plane and said eighth plane; and said third and fourth planes binding said sixth plane to seventh plane.

4,174,740

METHOD AND APPARATUS FOR SUPPLYING INGREDIENTS TO A CONCRETE MIXER

Hugh J. Tobler, 103 N. Kenwood, Indianola, Iowa 50125

Filed Aug. 21, 1978, Ser. No. 935,534
Int. Cl.[2] B65B 1/04
U.S. Cl. 141—1 **10 Claims**



1. A mobile device for supplying ingredients to a concrete mixer, said device comprising:

a vehicle having wheels rotatably mounted to a vehicle frame and supporting said vehicle frame for rolling movement;

a cement container mounted on said vehicle frame, said cement container having a top wall, a pair of opposite side walls, a bottom wall and a pair of opposite end walls, said side walls converging toward one another as they extend downwardly from said top wall to said bottom wall;

one of said end walls having an outlet opening adjacent the lower end thereof adjacent said bottom wall;

a first auger conveyor mounted within said container adjacent said bottom wall and extending along the length of said bottom wall, one end of said first conveyor being adjacent said outlet opening, said conveyor being rotatable to carrying cement out through said outlet opening;

cement fluffing means positioned below said first auger conveyor, said fluffing means being connected to a source of compressed air and being capable of introducing said compressed air into said container from below said first auger conveyor whereby said first compressed air fluffs the cement around said first conveyor and inhibits packing of said cement during movement of said vehicle;

external conveyor means located outside said cement container and connected to said outlet opening of said cement container for carrying cement from said container to a concrete mixer;

said container having an inlet opening therein for permitting the introduction of cement into said container,

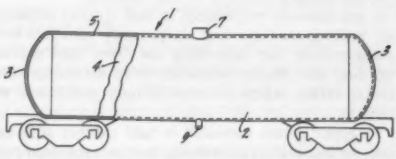
said container sidewalls first converging towards one another adjacent their lower ends and then flaring outwardly away from one another at the lowermost portions of their lower ends, wherein said first auger conveyor is positioned adjacent the point where said sidewalls begin flaring outwardly.

4,174,741

METHODS FOR LOADING AND UNLOADING LIQUIDS FROM A RAILROAD TANK CAR

James D. Parsons, Munster, and Jerome A. Sivak, Hammond, both of Ind., assignors to Union Tank Car Company, Lincolnshire, Ill.

Filed Aug. 10, 1978, Ser. No. 932,892
Int. Cl.[2] B65B 3/06
U.S. Cl. 141—2 **10 Claims**



1. The method of loading an enclosed container which has its interior changeable into different chambers for non-compatible liquids by a flexible diaphragm that alternately lines opposite portions of such container, comprising the steps of:

A. emptying the liquid from said container and flowing air at atmospheric pressure into the chambers on both sides of said diaphragm;

B. sealing one of said chambers so as to trap air at atmospheric pressure on one side of said diaphragm;

C. venting the opposite side of said diaphragm to the atmosphere and flowing liquid into the chamber on said opposite side in such manner that the trapped air on said one side of said diaphragm is displaced by rising liquid, said displaced air moving the upper portion of said diaphragm in one direction while the rising liquid moves the lower portion of said diaphragm in the opposite direction, whereby said diaphragm is stretched out in tension as it is moved upwardly into contact with said container;

D. after said container is partially filled with liquid, releasing said trapped air by venting said one side of said diaphragm to the atmosphere;

E. continuing to load liquid into said container; and

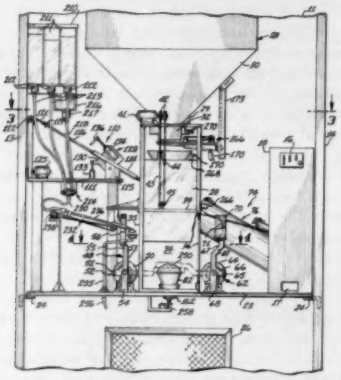
F. sealing both of said chambers when the loading of said container is complete.

4,174,742

METHOD AND APPARATUS FOR MAKING AND DISPENSING SNOW CONES

James D. Murphey, 2438 W. Butler, Phoenix, Ariz. 85021

Filed Feb. 8, 1978, Ser. No. 875,982
Int. Cl.[2] B65B *1/04, 43/42*
U.S. Cl. 141—11 **18 Claims**



1. A machine for making snow cones comprising:
(a) a cabinet;
(b) a compartment in said cabinet, said compartment having a cup retaining structure upstandingly mounted therein;
(c) cup delivery means in said cabinet adjacent said compartment for delivering a cup to the cup retaining structure in said compartment;
(d) a collar means for collecting and retaining ice mounted in said cabinet adjacent said compartment, said collar means reciprocally movable into said compartment to a position which upstandingly circumscribes the rim of the cup when delivered thereinto;
(e) on ice making machine in said cabinet;
(f) an ice delivery mechanism in said cabinet adjacent said ice making machine and reciprocally movable into said compartment for delivering ice from said ice making machine into the cup when delivered thereto and into said collar means when circumscribingly positioned relative thereto;
(g) a capper means mounted in said cabinet adjacent said compartment and reciprocally movable into said compartment to a position above said cup retaining structure so that when ice is deposited in the cup and in said collar means, said capper means will form the ice into a dome configuration extending above the rim of the cup;
(h) a reservoir for containing flavored syrup in said cabinet; and
(i) syrup delivery means mounted in said cabinet and coupled to said reservoir, said syrup delivery means reciprocally movable into said compartment above the cup retaining structure, said syrup delivery means actuatable to deposit a predetermined amount of flavored syrup onto the dome of ice when formed on the cup.

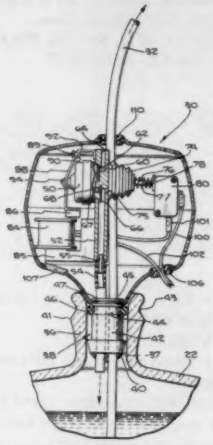
4,174,743

SYSTEM FOR TRANSFERRING WATER

Janos Beny, 23775 Madison St., Torrance, Calif. 90505, and Albert M. Herzig, 700 N. Rexford Dr., Beverly Hills, Calif. 90210

Filed Nov. 21, 1977, Ser. No. 853,498
Int. Cl.[2] B67D *5/54;* **B65B** *3/04*
U.S. Cl. 141—18 **11 Claims**

1. A water supply system adapted for utilization with a water dispensing system having a water reservoir and a dispensing faucet comprising in combination, a housing means which carries a stopper member adapted for insertion into the neck of a water bottle, pump means in the housing for pumping air and tubular means connected to the pump and extending through the said stopper so as to communicate with the interior of the water bottle, further tubular means extending through the stopper, further means to which the end of said further tubular means extends, said last means being constructed to be



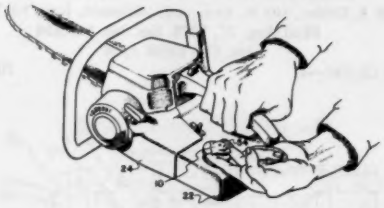
carried by the said water reservoir and including a float valve means for controlling flow from said further tubular means, said pump means being actuatable to pump air into the water bottle for forcing water from the water bottle into the water reservoir under control of the float valve means said further tubular means being a single tube extending from said housing to said further means.

4,174,744

CONTAINER CLOSURE WITH COMPARTMENT

James R. Houghton, 34485 Kirkpatrick Rd., R.R. 3, Mission, British Columbia, Canada (V2V4J1)

Filed Apr. 25, 1978, Ser. No. 899,978
Int. Cl.[2] B65B *3/06*
U.S. Cl. 141—98 **7 Claims**



1. A container enclosure adaptable for direct detachable coupling to the inlet of a liquid fuel tank, which enclosure provides for subsequent discharge into said tank when so desired by user, together with means to serve as funnel for the purpose of pouring liquid fuel directly into said fuel tank, which enclosure is fitted with indicia means for measuring a fixed volume of lubricant that may be subsequently added into said tank, with

said enclosure formed with a bottom outlet opening, said outlet opening of a size and shape to attach about the mouth of the inlet of a liquid fuel tank such as a tank of an internal combustion engine powered saw, and with

said enclosure formed with a top inlet opening of a substantially greater area than the area of the bottom outlet open-

ing with said container formed with a hollow interior chamber that communicates with said outlet opening and said inlet opening so that the container serves as a funnel for pouring of liquid fuel into said inlet opening and out of said outlet opening into the mouth of an attached liquid fuel tank, together with

removable means in said interior chamber to block communication between the interior of the chamber and the bottom inlet opening so that liquid stored in said interior chamber serves as a reserve supply of fuel to the attached tank when the said communication is blocked by said means, together with

a cover detachably mounted to the enclosure which is shaped to close the top inlet opening.

4,174,745

DEVICE FOR MAKING A GROOVE IN THE EDGE OF A PANEL

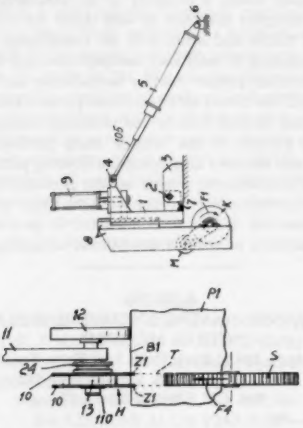
Gino Benuzzi, 5, Via Angelo Custode, Bologna, Italy (40100)

Filed Sep. 19, 1977, Ser. No. 834,351

Claims priority, application Italy, Sep. 20, 1976, 12796 A/76; May 13, 1977, 12604 A/77

Int. Cl.[2] B27C *9/00*

U.S. Cl. 144—1 R **3 Claims**



1. In a sawing machine for cutting panels and the like, of the type in which said panels are supported on a horizontal supporting table and a main circular saw effects the cutting in a vertical plane and moves across said supporting table along a horizontal cutting line, a device for making at least one groove or incision in the edge of said panels at the line of entry or of exit of said circular saw into or respectively out of said panels, comprising

(a) a grooving saw arranged in a vertical plane in alignment with said cutting plane of said main circular saw;

(b) means for moving said grooving saw in said vertical plane against and along said edge to effect its working stroke, and for withdrawing said grooving saw to a rest position remote from said edge, above or below said panel; and

(c) feeler means for guiding said grooving saw in its working stroke, said feeler means comprising a feeler roller which follows the contour of the edge of said panel and guides said grooving saw along a path corresponding to said contour.

4,174,746

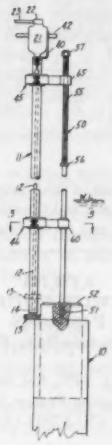
PILE SIZER

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133, and James Williamson, P.O. Box 93, Tahoe City, Calif. 95730

Filed Oct. 31, 1977, Ser. No. 847,057

Int. Cl.[2] B27C *5/00*

U.S. Cl. 144—134 R **4 Claims**



1. Apparatus for reducing the lateral extent or diameter of the top portion of a submerged pile comprising:

a vertically disposed elongated tube adapted to be positioned with its upper end above water level and its lower end below water level.

a pile cutter at the lower end of said tube,

an elongated shaft rotatably supported within said tube and connected to said cutter at its lower end,

motor means mounted on the upper end of said tube for driving said shaft,

an elongated vertically extending anchor member adapted to be secured at its lower end to the upper end of said pile,

means connecting said tube to said anchor member permitting orbital movement of said tube and cutter about said pile, and

means permitting vertical movement of said last mentioned means and said tube, shaft and motor means automatically as a unit relative to said anchor member during said orbital movement.

4,174,747

GOLF CLUBS RESTRAINER MEANS FOR USE WITH GOLF BAG

Richard J. Boles, Louisville, Ky., assignor to Crest Circle, Inc., Louisville, Ky.

Filed Nov. 13, 1978, Ser. No. 960,305

Int. Cl.[2] A63B *55/00*

U.S. Cl. 150—1.5 R **11 Claims**

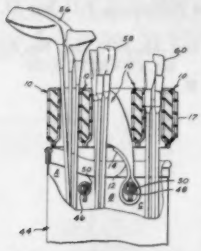
1. A golf clubs restrainer means for use in the top opening of a golf bag for the padded protection of a set of golf clubs, said restrainer comprising:

(a) a narrow, elongated strap of flexible material having resilient padding means for much of the length thereof;

(b) and a plurality of complementary fastening means provided along the strap;

(c) a first anchoring means formed by certain of the said fastening means adjacent the starter end of the strap and

adapted for attaching the strap to an anchoring means of a golf bag;

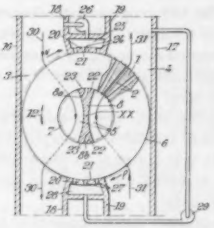


(d) a complementary set of said fastening means being adjacent both the finish end and the midsection of the strap for fastening this finish end to the main body of the strap.

4,174,748
HEAT-EXCHANGER WITH ROTOR HAVING RADIAL PASSAGES

René Denjean, Pavillons-sous-Bois, France, assignor to Air Industrie, France

Filed Dec. 2, 1977, Ser. No. 856,632
Claims priority, application France, Dec. 7, 1976, 76 36797
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—5 **4 Claims**



1. A dynamic heat-exchanger for exchanging heat between fumes of combustion and combustive air, said heat-exchanger comprising:

two circulation ducts, respectively for fumes and combustive air,

an annular rotor extending into both said circulation ducts, said rotor having a disengaged central space, said rotor having an outer and an inner cylindrical surface, a dividing wall located in and dividing said central space and extending parallel to the two said circulation ducts, the rotational axis of said rotor being perpendicular to the direction of extension of said two circulation ducts, at least immediately adjacent said rotor,

substantially radial passages provided in said rotor so as to connect said outer cylindrical surface to said inner cylindrical surface so that fumes and combustive air flow radially through said rotor in one sector and in another sector of said rotor, respectively,

two spaced apart outer sealing zones provided on said outer cylindrical surface of said rotor,

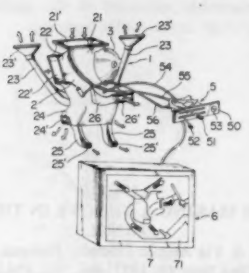
a respective inner sealing zone for each said outer sealing zone and being provided on said inner cylindrical surface of said rotor, and

fluid jet cleaning means provided for blowing in the passages of the rotor, this blowing taking place between respective first facing outer and inner sealing zones, said fluid jet cleaning means being connected to take fumes from upstream of the exchanger and to blow these fumes in said passages of said rotor when said passages pass from said fume circulation duct to said combustive air circulation duct.

4,174,749
AIR CONDITIONING DISPLAY SYSTEM FOR VEHICLES

Hideo Oishi, Okazaki, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,783
Int. Cl.[2] F28F *27/00*
U.S. Cl. 165—11 **34 Claims**

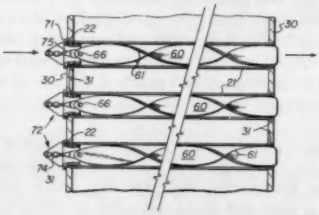


1. An air conditioning display system for a vehicle comprising a vehicle's air conditioner proper including at least a plurality of air intake ducts, a plurality of air discharge ducts, a plurality of dampers disposed in said ducts for closing and opening said ducts, and a fan unit, air conditioner actuating means for actuating at least said dampers and said fan unit in said air conditioner proper thereby introducing and discharging air into and out of said air conditioner proper, and a display device mounted in said vehicle and including a display panel carrying the picture of the vehicle body portions at least around the front seat and displaying the flowing patterns of air out of said air conditioner proper on the portions of said display panel corresponding to the vehicle body portions at which air flows out of said air conditioner proper in response to the manipulation of said air conditioner actuating means.

4,174,750
TUBE CLEANER HAVING ANCHORED ROTATABLE SPIRAL MEMBER

Billy M. Nichols, 21422 Park Rock La., Katy, Tex. 77450

Filed Apr. 18, 1978, Ser. No. 897,382
Int. Cl.[2] F28G *3/00, 15/08*
U.S. Cl. 165—94 **2 Claims**



1. A tube cleaning device for use in a heat exchanger comprising:

a plurality of tubes adapted to have a fluid pass therethrough; and

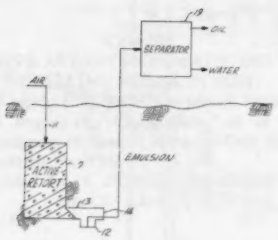
rotatable means for preventing contaminant build-up on the interior wall provided each of said tubes, said rotatable means comprising a spiral having one end rotatably an-

chored by anchoring means to the upstream end of an associated tube, said anchoring means including a plug fixed to said upstream end and swivel means linking said plug and said rotatable means.

4,174,751
METHOD OF BREAKING SHALE OIL-WATER EMULSION

Leslie E. Compton, Claremont, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 23, 1978, Ser. No. 871,368
Int. Cl.[2] E21B *43/24*; E21C *41/10*; B01D *17/04*
U.S. Cl. 166—256 **23 Claims**



18. A method for recovering shale oil from an in situ oil shale retort in a subterranean formation containing oil shale, said in situ oil shale retort containing a fragmented permeable mass of particles containing oil shale, comprising the steps of:

retorting oil shale in the fragmented permeable mass and producing an emulsion of shale oil and water;

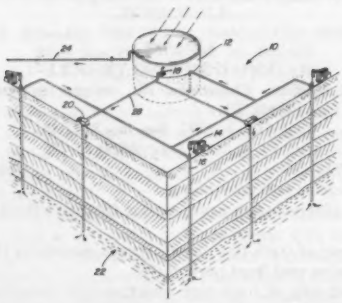
withdrawing emulsion of shale oil and water from the retort;

maintaining a volume of such emulsion of shale oil and water at a bulk temperature of at least about 120° F., and subjecting portions of such emulsion to momentary, localized heating to temperatures substantially above the bulk temperature of the volume of emulsion until shale oil and water are substantially separated.

4,174,752
SECONDARY RECOVERY METHOD AND SYSTEM FOR OIL WELLS USING SOLAR ENERGY

Frank W. Slater, P.O. Box 186, and Dale Fuqua, P.O. Box 247, Star Route, both of Durant, Okla. 74701

Filed Jan. 24, 1978, Ser. No. 871,966
Int. Cl.[2] E21B *43/24*; F24J *3/02*
U.S. Cl. 166—303 **8 Claims**



1. A method for secondary recovery of crude oil from an oil formation, comprising the steps of:

disposing a halogenated hydrocarbon working fluid into heat absorbing relation to a source of heat energy to heat the working fluid;

circulating the heated working fluid into heat exchanging relation with the quantity of crude oil to heat the crude oil; and

injecting at least portions of the heated crude oil into the oil formation to reduce the viscosity of the crude oil in the oil formation in at least localized portions thereof, thereby to allow a greater recovery of crude oil from the formation.

4. Apparatus for the secondary recovery of crude oil from an oil formation, comprising:

a storage tank for temporarily holding crude oil, the storage tank acting as heat exchange system having a working fluid circulating within a closed loop circulatory system for transferring heat to the crude oil from the working fluid;

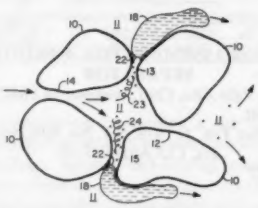
means for heating the working fluid in the storage tank; and

pump means for injecting at least portions of the heated crude oil into the oil formation to reduce the viscosity of the crude oil in the oil formation in at least localized portions thereof, thereby to allow greater recovery of crude oil from the formation.

4,174,753
WELL STIMULATION BY TWO-PHASE FLOW

John W. Graham, 210 County Rd. 147, Rte. 5, Box 58, Alvin, Tex. 77511

Filed Sep. 7, 1977, Ser. No. 831,162
Int. Cl.[2] E21B *43/27, 43/122*
U.S. Cl. 166—307 **11 Claims**



1. A method for treating a porous subterranean formation which comprises injecting, under matrix rates and pressures, a non-emulsified intimate mixture of an aqueous liquid forming a continuous phase and a fluid forming a discontinuous phase into said formation to cause two-phase flow through at least a portion of the porous formation, said mixture being substantially free of surface-active agents tending to form emulsions, said aqueous liquid comprising at least 60 volume percent of said mixture and being substantially immiscible with said fluid and being capable of wetting formation materials.

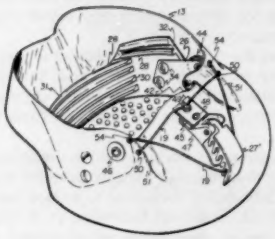
4,174,754
ADJUSTABLE BOOT TYPE COMPOSITION HORSESHOE

Neel W. Glass, Cuyamungue, N. Mex., assignor to Les-Kare, Inc., Santa Fe, N. Mex.

Filed Dec. 16, 1977, Ser. No. 861,286
Int. Cl.[2] A01L *3/00, 5/00*
U.S. Cl. 168—18 **3 Claims**

1. An improved composition molded shoe for horses comprising a sole and integral walls conforming in shape to a horse's foot, a re-entrant fold on each side of the front shoe wall having the fold creases lying in the plane substantially that of the front of the hoof, a pair of brackets symmetrically located and affixed to the shoe upper portions rearward of and proximate the re-entrant folds, each of said brackets being generally rhombic shaped and adapted to be affixed inside the shoe side walls, a cable engaging grooved means affixed to each of said brackets at a front upper portion, a plurality of inwardly and downwardly inclined teeth on the lower edge of

said brackets, a elongated composition strap having downwardly inclined serrations positioned inside the shoe in approximately a semi-circle around the inside of the rear part of the shoe, means attaching the ends of the strap to the shoe side walls and the brackets, a continuous loop binding cable, a pair of vertically spaced apertures in each front portion of the shoe side wall located to be tangential, substantially to the top and



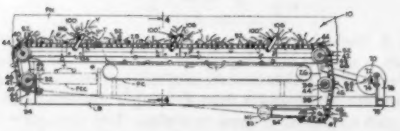
bottom of cable engaging grooved means, a cable anchoring bracket affixed to the upper midpoint of the shoe front wall, means affixing the cable to said bracket, said cable then dividing to the right and to the left of the front of the shoe, passing into the shoe through the lower apertures, engaging the cable engaging grooved means, passing out of the shoe through the upper apertures for engagement with over-center buckle means.

4,174,755

AGITATOR ASSEMBLY FOR A FRUIT-VINE SEPARATOR

Michael P. Siri, Palo Alto, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 1, 1978, Ser. No. 874,296
Int. Cl.[2] A01D *33/02*
U.S. Cl. 171—27 **5 Claims**



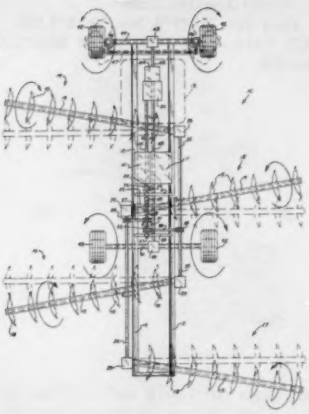
1. An agitator assembly for use in combination with an apparatus for separating fruits such as tomatoes from the vines of the plant, the separating apparatus being of the oscillatory type including a pair of longitudinally extending side frame members, a pair of shafts mounted transversely between the front and rear ends of the side frame members, a plurality of parallel endless conveyors having spaces therebetween through which separated fruits may fall and parallel reaches for conveying the vines, said conveyors being supported on said shafts, means for synchronously oscillating said side frame members in fore-and-aft directions parallel to said conveyors, and means for simultaneously continuously driving said conveyors in a direction of travel, said agitator assembly comprising: a member mounted transversely between said side frame members below said reaches of said conveyors; and a plurality of agitator bars rigidly mounted to said transverse member in parallel relationship and at intervals aligned with the spaces between said conveyors; each agitator bar having an upstream face which is upwardly inclined in said direction of travel of the conveyors at a selected acute angle relative to the conveyor reaches and with the upstream faces of said agitator bars extending above the conveyor reaches, whereby the vines on the conveyors are lifted as the vines are conveyed in said direction of travel and are dropped back onto said conveyors as they move over the agitator bars to hence facilitate the movement of the fruit downwardly through the vines.

4,174,756

SELF-PROPELLED DISK HARROW MACHINE

Kermit M. De Haai, R.R. 1, Monroe, Iowa 50170

Filed Apr. 3, 1978, Ser. No. 892,675
Int. Cl.[2] A01B *9/00*
U.S. Cl. 172—55 **8 Claims**



1. A self-propelled disk harrow comprising:
a frame;
a plurality of wheels rotatably attached to said frame, the forwardmost of said wheels being spaced longitudinally from the rearwardmost of said wheels by at least one-half the operable length of the frame;
means rotatably mounting a plurality of ground engaging disc members to said frame for causing said disc members to carry substantially all of the weight of said disk harrow during normal tilling operations, said disc members extending a substantial distance below said wheels when said disk harrow is in a ground tilling position;
means operatively attached to said frame for rotating said disc members to thereby propel said disk harrow and till the ground;
means operatively attached to said frame for rotating all of said wheels at substantially the same speed as the rotational speed of said disc members whereby if said disc members extend into the ground more than said substantial distance, a substantial amount of the weight of the disk harrow will transfer to said wheels to help propel the disk harrow and prevent it from becoming stuck.

4,174,757

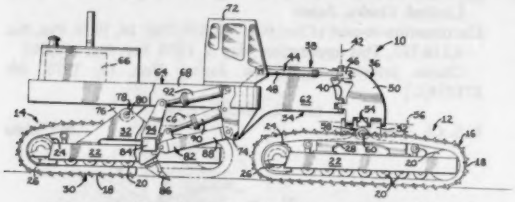
MATERIAL RIPPING VEHICLE

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 3, 1977, Ser. No. 839,049
Int. Cl.[2] A01B *35/14;* **B62D** *55/00*
U.S. Cl. 172—292 **14 Claims**

12. A vehicle (10) comprising:
a frame (34) including a rear portion (38) and a front portion (36);
a first pair of track-type undercarriage assemblies (16) connected to said front portion (36);
a second pair of track-type undercarriage assemblies (30) connected to said rear portion (38) and being spaced laterally apart;
an operator's station (72) connected to said rear portion (38);
a power plant (66) connected to said rear portion (38); and

a work implement (82) connected to said rear portion (38) and being located substantially longitudinally between



said operator's station (72) and said power plant (66) and substantially laterally between said second pair of track-type undercarriage assemblies (30).

4,174,758

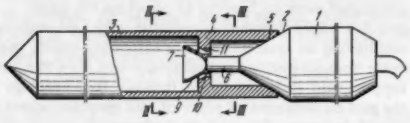
PERCUSSIVE ACTION PNEUMATIC DEVICE FOR DRILLING HOLES IN SOIL

Alexandr D. Kostylev; Nikolai P. Chepurnoi; Vladimir D. Plavskikh, and Evgeny N. Cherednikov, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, U.S.S.R.

Filed Jan. 4, 1978, Ser. No. 866,864

Int. Cl.[2] E21B *11/02*

U.S. Cl. 175—19 **2 Claims**



1. A pneumatic device for making holes in soil by compaction thereof comprising, a driving cylindrical impact housing having a conical head portion, a tubular tip releasably mounted axially forwardly of said housing, said tip having a conical point and an internal transverse partition to which said housing is releasably connected for driving of said tip axially by said impact housing, said conical head portion extending inwardly of said tubular tip, said tip having a tail portion open to receive said conical head portion and on which said housing seats, connection menas on said conical head portion for releasably connecting said housing to said partition, said partition having a central opening for inserting said connection means therethrough and rotating it in one direction for connecting to said partition after insertion of said connection means into said opening.

4,174,759

ROTARY DRILL BIT AND METHOD OF FORMING BORE HOLE

Donald P. Arbuckle, 1203 18th St., Golden, Colo. 80401

Filed Sep. 19, 1977, Ser. No. 834,656

Int. Cl.[2] E21B *7/18*

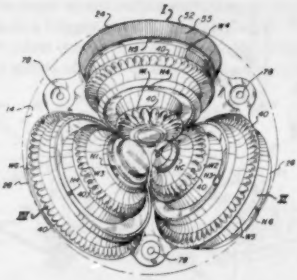
U.S. Cl. 175—67 **82 Claims**

1. A rotary drill bit for cutting an axially advancing bore hole by rotation at a drill face of the bore hole, comprising:

a drill bit body, said drill bit body comprising a plurality of axle shafts extending radially toward the axis of rotation of said drill bit;

at least one breaking wheel attached for rotation on each axle shaft to traverse a path concentric with the axis of rotation of said drill bit when rotated in contact with the drill face of the bore hole, at least a few of said breaking wheels are positioned to traverse essentially different paths concentric with the axis of rotation, and

fluid jet means, positioned on said drill bit body radially adjacent at least one breaking wheel, for cutting a plurality of different concentric slots concentric with the axis of rotation when said drill bit is rotated, each pair of radially



adjacent concentric slots defining edges of one concentric path traversed by at least one breaking wheel.

4,174,760

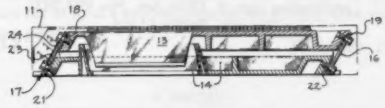
SCALE CONSTRUCTION

Donald B. Curchod, San Jose, Calif., assignor to Nortron Corporation, Sunnyvale, Calif.

Filed Nov. 30, 1977, Ser. No. 855,894

Int. Cl.[2] G01G *3/14*

U.S. Cl. 177—211 **9 Claims**



1. A scale construction comprising a pair of substantially rigid plates disposed in spaced relation one above the other, said plates defining spaced load-bearing planes, semi-rigid flexure members connected between the ends of said plates to support one plate spaced from the other, said members being disposed at a common oblique angle to the load bearing planes to define a parallelogram when taken with said planes, strain gauge means carried by one of said flexure members, and means responsive to said strain gauge means serving to indicate the weight of a body disposed in weight transfer relation to the top one of said plates.

4,174,761

RUNNING TRAVEL MANEUVERING APPARATUS FOR AN ENGINEERING WORK VEHICLE

Hideaki Matsuyoshi; Yukio Shimono, both of Sakai; Yuji Tsutsui, Osaka; Shigeru Miyuki, Sakai; Takao Watanabe, Osaka, and Hideaki Mizota, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Mar. 23, 1978, Ser. No. 889,589

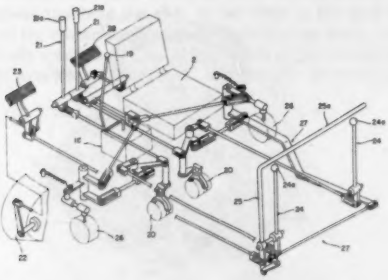
Claims priority, application Japan, Apr. 18, 1977, 52-49076[U]

Int. Cl.[2] B62D *11/08*

U.S. Cl. 180—6.7 **5 Claims**

1. An earth handling vehicle capable of moving in opposite directions comprising a chassis supported relative to the earth by laterally disposed drivable track mechanisms and steering clutches therefor, said chassis further including an engine transmission, gearshift lever therefor and maneuvering apparatus comprising front and rearwardly disposed interconnected actuators associated with a main clutch means that is drivably connected to said transmission, one each front and rearwardly disposed interconnected steering levers connected to said steering clutches, each of said steering levers provided with

hand grip portions, further wherein said rearwardly disposed actuator further includes a portion that extends transversely of



said vehicle and in close proximity to said hand grip portions of said steering levers.

4,174,762

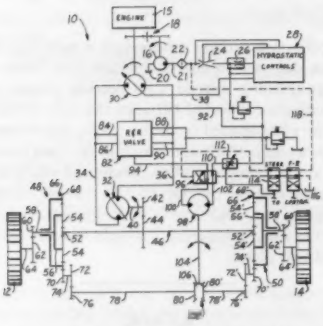
HYDROSTATIC TRANSMISSION WITH DIFFERENTIAL STEERING

Donald L. Hopkins, Joliet, and Gordon W. Johnson, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 764,946, Feb. 2, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 893,202

Int. Cl.[2] B62D *11/06*

U.S. Cl. 180—6.44 **8 Claims**



1. A drive and steering system for a vehicle having a pair of tracks comprising:

a hydrostatic transmission having a hydrostatic fluid motor;

means operatively coupling the hydrostatic motor and tracks, to drive the tracks of the vehicle;

hydrostatic control means for controlling said hydrostatic fluid motor;

another fluid motor;

means for selectively communicating pressurized fluid to the another motor to selectively drive the another motor, wherein said communicating means (i) is provided in fluid communication with said hydrostatic fluid motor such that the fluid driving said hydrostatic fluid motor can also selectively drive said another motor and (ii) is operatively associated with said hydrostatic control means; and

means operatively coupling the another motor and at least one of the tracks for providing a relative differential movement between the tracks different from the relative driving movement thereof provided by the hydrostatic fluid motor.

4,174,763

DRIVE CONTROLLING MECHANISM

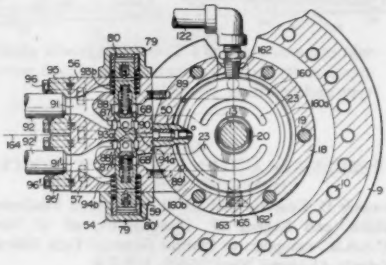
Kiyozumi Fukui, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 750,537, Dec. 14, 1976, Pat. No. 4,114,737. This application May 5, 1978, Ser. No. 903,044

Claims priority, application Japan, Dec. 18, 1975, 50-171224[U]

Int. Cl.[2] B62D *11/08*

U.S. Cl. 180—6.48 **20 Claims**



1. A crawler type travelling vehicle comprising in combination:

an endless belt including a number of segments flexibly connected with each other to crawl on the earth;

a sprocket wheel drivably engageable with said endless belt and having an axial wheel bore extending axially thereof;

a motor housing inserted in said axial wheel bore to rotatably support said sprocket wheel through two bearings with the mid-circumferential plane of said sprocket wheel positioned between the mid-circumferential planes of said bearings;

a fixed frame positioned axially inwardly of said sprocket wheel to securely support said motor housing and having an axial frame bore in axial alignment with said axial wheel bore;

a hydraulic motor accommodated in said motor housing and having a rotary shaft;

a reduction gear unit positioned axially outwardly of said sprocket wheel and within the width of said endless belt to operably be connected with one end portion of said rotary shaft in driving engagement with said sprocket wheel;

a control block disposed within the width of said endless belt and securely connected with the axially inner face of said motor housing to rotatably receive the other end portion of said rotary shaft; and

a pair of inlet-outlet passages in fluid communication with said hydraulic motor to allow fluid under pressure to pass therein for imparting rotation of said hydraulic motor.

4,174,764

STEERING COLUMN SWITCH MOUNTING

Erich Mutschler, and Adam Weber, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to SWF-Spezialfabrik für Autozubehör Gustav Rau GmbH, Fed. Rep. of Germany

Filed Aug. 11, 1975, Ser. No. 603,381

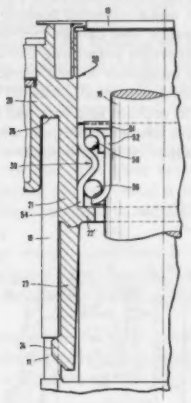
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1974, 2438653

Int. Cl.[2] B60K *26/00*; H01H *3/16*

U.S. Cl. 180—78 **10 Claims**

9. A steering column switch mounting for use in association with a steering column having a steering tube arranged around the exterior thereof in spaced relation thereto, comprising a switch base plate member having an inner cylindrical sleeve portion engageable between the steering tube and the steering column and a portion extending outwardly from the top of said cylindrical sleeve portion over the top of the steering tube and a portion extending exteriorly of the steering tube forming a

switch base plate, said cylindrical sleeve portion having at least one elastic strip with a locking stud formation which is biased



into locking engagement with the steering tube at a predetermined location from the top of the steering tube.

4,174,765

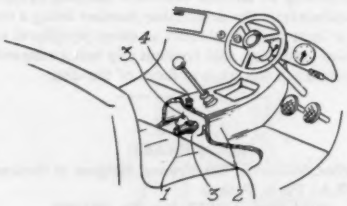
VEHICLE CONTROL SPEED SENSING METHOD

John H. Moshal, 2A Menston Rd., Westville, Natal Province, and Alan B. Murray, 12 Forest Dr., Forest Hills, Kloof, Natal Province, both of South Africa

Filed Jul. 21, 1976, Ser. No. 707,342

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—313 **9 Claims**



1. A method of generating an electrical signal proportional to the road speed of a vehicle comprising setting up a specific magnetic field in association with a normally unmagnetized component of the vehicle which rotates at a speed proportional to the road speed of the vehicle, the rotation of said component causing variations in said magnetic field, and sensing said variations in the magnetic field by means of a signal generating sensor including a coil, said signal generating sensor located entirely on one side of a ferromagnetic member which is disposed between said component and signal generating sensor, and amplifying the signal generating sensor output signal through a high gain amplifier.

4,174,766

SPEED SHIFT INDICATOR

Thomas A. Kalogerson, Minneapolis, Minn., assignor to Kaltron Company, Inc., Minneapolis, Minn.

Filed Jul. 27, 1978, Ser. No. 928,514

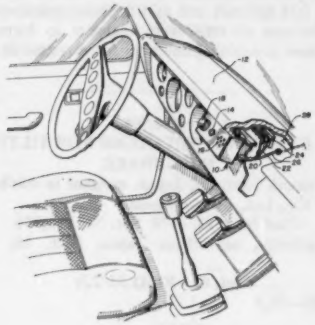
Int. Cl.[2] B60K *23/00*

U.S. Cl. 340—52 D **11 Claims**

1. A speed shift indicating device for a vehicle driven by an internal combustion engine having an ignition system, the vehicle having a manually controlled transmission, the speed shift indicating device comprising:

trigger means for receiving an input electrical signal having a repetition rate indicative of engine RPM and providing trigger pulses in response to the input electrical signal;

timer means having an output which has first and second states, the timer means output switching to the first state in response to a trigger pulse and remaining in the first state only for a first time period unless another trigger pulse is received before the end of the first time period;



adjusting means for adjusting the first time period;

annunciator means to indicate, when energized, the need to shift the transmission; and

annunciator control means for energizing the annunciator means only if the timer means output remains in the first state for at least a second time period greater than the first time period.

4,174,767

AIR-LINE LUBRICATORS AND THE LIKE

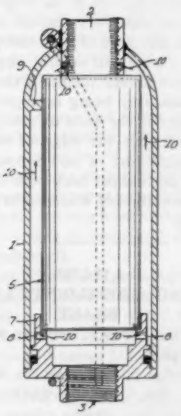
Petrus H. Kramer, Krugersdorp, South Africa, assignor to West Rand Engineering Works (Proprietary) Limited, Transvaal, South Africa

Filed Nov. 10, 1976, Ser. No. 740,359

Claims priority, application South Africa, Nov. 13, 1975, 75/7139

Int. Cl.[2] F16N *7/32*

U.S. Cl. 184—55 A **5 Claims**



1. A removable refillable container holding lubricant for use in an air-line lubricator employing pressurized fluid, said refillable container comprising a relatively rigid sleeve having a closure at one end thereof and an aperture through said end forming a passage through which the lubricant can pass out of

or into said container, said sleeve having an open rear end, a flexible sock having a mouth portion anchored to the side of said sleeve forming an expandable chamber for holding said lubricant, and a toe extending toward said open end of said sleeve, said flexible sock separating said chamber from said pressurized fluid while urging said lubricant out of said chamber through said aperture, said sock having a body length sufficient to permit substantial exhaustion of the lubricant from the sleeve, said aperture and said flexible sock cooperating to receive lubricant to refill said chamber to form a newly charged grease containing chamber to be reused in said lubricator.

4,174,768

CALIPER CARRYING STRUCTURE FOR TILTING TYPE DISC BRAKE

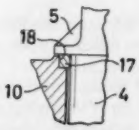
Fumio Takemori, Iwatsuki, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,976

Claims priority, application Japan, Mar. 16, 1977, 52-31920[U]

Int. Cl.[2] F16D *55/224*

U.S. Cl. 188—72.3 **7 Claims**



1. A tilting type disc brake comprising: a rotatable disc to which said brake is applied; a support shaft having a longitudinal axis oriented parallel to a plane defined by a side of said disc and a shaft part and a flange part; a pair of friction pads disposed on both sides of said disc; a caliper provided with pushing means which acts to push one of said pair of friction pads against one side of said disc and a reaction part which pushes the other of said friction pads against the other side of said disc by reaction to the action of said pushing means, said caliper also having an opening through which the shaft part of said support shaft is inserted for mounting said caliper on said support shaft for pivoting movement between a resting position and a pivoted position; and a single elastic ring fitted in a circumferential groove formed in the edge of said opening of said caliper with one side face thereof being disposed and arranged in the axial direction of said shaft part of said support shaft to engage the flange part of said support shaft and with the inner circumferential face thereof arranged to engage said shaft part, said elastic ring being arranged to normally hold said caliper resiliently in the axial direction of said shaft part with a clearance between the edge of the opening of said caliper and the flange part of said support shaft and being capable of bringing said caliper back from said pivoted position to said resting position thereof when the brake is released from a braking operation.

4,174,769

DISC BRAKE AND A RESILIENT CLIP FOR SUCH A BRAKE

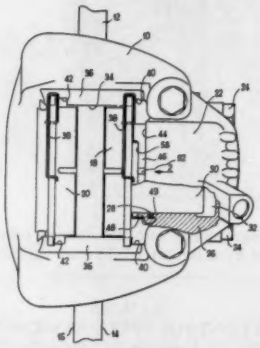
Jean L. Gerard, Paris, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Mar. 3, 1978, Ser. No. 883,100

Int. Cl.[2] F16D *65/02*

U.S. Cl. 188—73.6 **11 Claims**

1. In a disc brake, a rotary disc having a pair of friction faces; a pair of friction pads, each of said friction pads being located adjacent one of said friction faces; a fixed member; a caliper member carried by said fixed member and straddling said disc; brake operating means associated with the caliper member so as to urge at least a first of said pads directly into frictional engagement with the corresponding friction face of the disc; said brake operating means comprising movable piston means capable to occupy an idle position when the brake is released, an operating position closer to the disc than the idle position when the brake is applied, and a retracted position further from the disc than the idle position; said caliper member being provided with at least one aperture permitting extraction of said first pad when said piston means are in their retracted position; at least one detachable member normally located between said first pad and the caliper to prevent said first pad from moving back opposite said aperture whatever the position occupied by the piston means; the caliper defining a surface substantially



parallel to the friction faces of the disc and facing said first pad, the detachable member being inserted between said surface and said first pad; said brake operating means further comprising a housing defining a cylinder portion receiving said piston means, said surface being formed on the housing around an end of the cylinder portion closer to the disc; and said cylinder portion comprising an annular extension running towards the disc from said surface, the detachable member being a resilient clip which at least partly embraces an outer peripheral surface of said annular extension, said resilient clip being adapted to be extracted parallel to the friction faces of the disc.

4,174,770

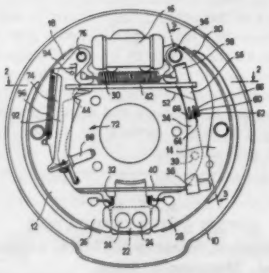
DRUM BRAKE

Pierre Courbot, Villiers le Bel, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Mar. 3, 1978, Ser. No. 883,064

Int. Cl.[2] F16D *65/56*

U.S. Cl. 188—79.5 P **17 Claims**



1. In a drum brake:

a rotary drum;

a pair of brake shoes, each of said shoes carrying wearable friction linings;

a fixed support having a fulcrum block receiving two adjacent ends of said shoes;

brake operating means located between two other ends of

said shoes and adapted to urge the latter toward the rotary drum;

a handbrake lever pivoted on one of said shoes in the vicinity of the operating means;

spacer means located between the shoes in the vicinity of the operating means, and capable to be engaged by the handbrake lever to urge said shoes toward the rotary drum;

abutment means between said one shoe and said lever to define an idle position of the lever, said abutment means being disengageable from the one shoe by tilting the lever away from the first shoe around an axis substantially perpendicular to the pivotal axis of the lever;

resilient means provided to normally hold the lever in its idle position;

said spacer means comprising a spacer and self-adjusting means adapted to increase the distance between said other ends of the shoes when idle on wear of the friction linings; and

said resilient means being inserted between the spacer and the handbrake lever so as to urge the latter toward the one shoe in a direction substantially parallel to the drum axis.

4,174,771

FRICTION CLUTCH

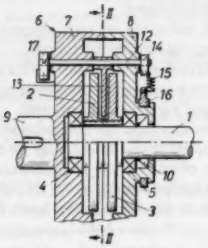
Manfred Hirt, Munich, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Fed. Rep. of Germany

Filed Aug. 10, 1977, Ser. No. 823,424

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636741

Int. Cl.[2] F16D *35/00, 43/25, 43/14*

U.S. Cl. 192—58 B **16 Claims**



1. In a friction clutch having at least one rotatable first friction member connected to a first clutch half and at least one rotatable second friction member connected to a second clutch half, a liquid, wherein the torque is transmitted by said liquid from said first friction member onto said second friction member, the improvement comprising wherein said first friction member is connected rotationally fixed to said first clutch half and has a first surface thereon, wherein said second friction member includes at least one segment having a second surface thereon parallel to said first surface, said first and second surfaces lying in axially spaced planes perpendicular to the axis of rotation of said first and second friction members, said segment being movably supported in the torque-transmitting vicinity of said first friction member on said first clutch half and includes stop means for limiting movement of said segment in a direction toward a first position wherein said first and second surfaces are opposed, the spacing between said first and second surfaces being such as to effect a shearing of said liquid to effect a drive between said segment and said first friction member.

4,174,772

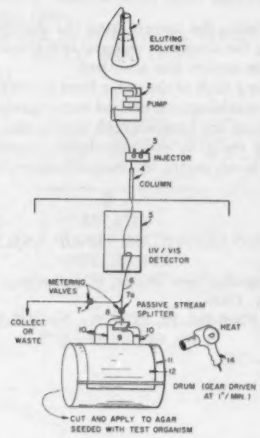
APPARATUS AND METHOD FOR COORDINATING CHROMATOGRAPHIC SEPARATION (HPLC) WITH UV/VIS ABSORBENCY VALUES AND WITH BIOAUTOGRAPH TEST RESULTS

Norbert Neuss, Indianapolis, and Roger D. Miller, Mooresville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 28, 1977, Ser. No. 865,278

Int. Cl.[2] C12K *1/04*

U.S. Cl. 435—32 **7 Claims**



1. An apparatus for coordinating UV/VIS absorbency values of a stream of eluate from a chromatographic column, said eluate having constituents therein with antimicrobial activity, with antimicrobial activity against a plurality of test organisms which comprises:

(a) a UV/VIS spectrophotometer for continuously monitoring the absorbency values of said eluate stream flowing continuously therethrough;

(b) a conduit connected at one end to said spectrophotometer and at the other end to a pair of parallel metering valves;

(c) a conduit connected to the discharge side of the first of the two metering valves and at the other end to a stream splitter, and a conduit connected to the discharge side of the second metering valve and at the other end to a waste disposal;

(d) a stream splitter connected to the conduit from said first metering valve and which divides the eluate stream from said valve into a plurality of independent eluate streams;

(e) a plurality of conduits each of which is connected at one end to said stream splitter at an outlet to receive one of the plurality of eluate streams from said stream splitter and the other end of which is open and disposed immediately above the drum of (f);

(f) a drum having affixed thereto a piece of absorbent material around the circumference of said drum, said drum disposed below the conduits of (e); and

(g) means to rotate said drum.

4. A method for coordinating UV/VIS absorbency valves of a stream of eluate from a chromatographic column, said eluate having constituents therein with antimicrobial activity, with bioautograph test results against a plurality of test organisms comprising:

(a) passing said eluate stream continuously through a UV/VIS spectrophotometer for continuously monitoring the absorbency values of said eluate stream;

(b) conveying the eluate stream exiting the UV/VIS spectrophotometer to a pair of parallel metering valves;

(c) adjusting said parallel metering valves so that the eluate

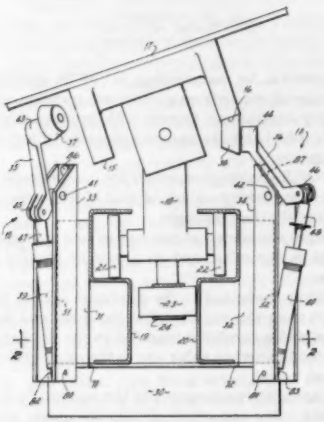
stream passing through the first of said valves is directed to a stream splitter and the eluate stream passing through the second of said valves is directed to a waste disposal;
(d) conveying the stream of eluate from said first metering valve to a stream splitter;
(e) splitting the stream of eluate from (d) into a plurality of streams of essentially equal volume;
(f) conveying each of said eluate streams from (e) to a separate point on a piece of absorbent material affixed to a drum adapted to be rotated;
(g) rotating said drum at a rate that allows each eluate stream to be absorbed in a narrow band on said absorbent material;
(h) evaporating the solvent from the absorbent material;
(i) dividing the absorbent material into strips whereon one of the eluate stream was absorbed;
(j) contacting each of the strips from (i) with a bioautograph media containing one desired test organism;
(k) incubating the bioautograph media; and
(l) relating the UV/VIS absorbency values with the test results shown on the incubated bioautograph media.

4,174,773

SORTATION CONVEYOR TIP-UP AND MOUNTING APPARATUS

Charles E. Venzke, New Berlin, Wis., assignor to A-T-O Inc., Willoughby, Ohio

Filed Jul. 19, 1977, Ser. No. 817,055
Int. Cl.[2] B65G *47/38*
U.S. Cl. 198—365 **20 Claims**



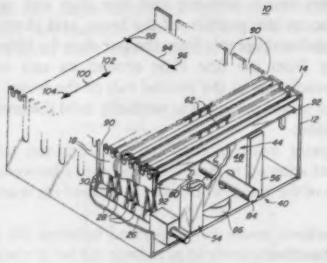
9. Tip-up apparatus for a sortation conveyor including:
an elongated support means adapted for connection to a sortation conveyor;
at least one upstanding angle means having a lower end mounted on said support means, said angle means having an apex directed outwardly of a sortation conveyor when assembled thereto, and legs opening toward said conveyor;
a U-shaped channel mounting bracket having two opposed legs and a web mounted on one of said angle means legs;
a crank arm pivoted to said bracket;
an actuating roller mounted on one end of said crank arm; and
actuating means connected to said crank arm for pivoting said crank arm and said roller into operative position with respect to said sortation conveyor, said crank arm pivoting in a plane at an angle to said sortation conveyor when assembled thereto,
said actuating means having an end mounted to said mounting bracket.

4,174,774

FOUR-WAY DIVERTING CONVEYOR

Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154

Filed Jan. 30, 1978, Ser. No. 873,242
Int. Cl.[2] B65G *47/00, 47/34*
U.S. Cl. 198 **5 Claims**



1. A modular positive drive high-speed response diverting conveyor unit comprising:
a support structure;
a static conveyor including a plurality of spaced rollers mounted in said support structure;
a drive apparatus disposed within said support structure for continuously driving said rollers;
a main direction control device for operating said drive apparatus to drive said rollers to convey selectively in the forward and reverse direction;
a support frame and a mounting structure carried on the support structure for slidably supporting said support frame; said mounting structure including spaced slides for slidably receiving a slide member carried by said support frame;
a dynamic roller conveyor having parallel sets of raised laterally spaced flights and a drive chain section carried by said support frame;
a drive system mounted on said support frame for continuously driving said roller conveyor;
a transverse direction control device for operating said drive system to drive said roller conveyor to convey selectively in the left and right directions; and
actuator means mounted on said support structure for moving said support frame selectively up to insert said flights interstitially of said rollers to divert conveyed goods from the main direction and down to withdraw said flights and allow goods to continue in the main direction.

4,174,775

APPARATUS FOR CONTINUOUSLY ORIENTING PLASTIC AND OTHER TYPES OF BOTTLES

Hugh P. McKnight, Indianapolis, and Kenneth B. Welty, Mooresville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

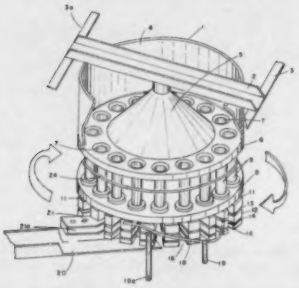
Filed Apr. 20, 1977, Ser. No. 789,056
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—397 **2 Claims**

1. An apparatus for the continuous high-speed orientation of randomly oriented plastic and other types of bottles having a transverse axes ratio of from about 1.5:1 to 1 comprising:
(a) a stationary receptacle for holding randomly oriented bottles;
(b) a rotatable round randomly oriented bottle feeding element, said feeding element spatially disposed immediately below said receptacle and cooperating and in communication therewith;
(c) a rotatable round delivery element connectedly disposed immediately below said feeding element, said delivery element comprised of a plurality of vertically disposed tubes cooperating and in communication with said feeding

element, and means for regulating the delivery of individual bottles from said feeding element to an orienting element;

(d) a rotatable round orienting-plate disposed immediately below said delivery element and connected thereto, said orienting-plate having vertical holes therein for receiving the bottles being oriented, each of said vertical holes having a vertical portion exposed at the exterior of said orienting plate with a width sufficient for discharge of bottles therethrough and having an inwardly protruding stop at the bottom thereof which stops and holds a bottle either by its base or its shoulder;

(e) means for engaging the neck of a bottle stopped in said vertical hole by the shoulder and moving said bottle by



the neck approximately 180° to an upright position while said bottle is disposed in said vertical hole, said means comprising a reorienting rail stationarily spatially disposed with respect to the orienting-plate, said bar beginning at a point immediately below the orienting-plate and inboard of the circumference of the vertical holes in the orienting-plate and directed gradually outwardly until it comes outboard of the orienting-plate and is then directed upwardly until it terminates at a position higher than the orienting-plate immediately before said bottles are discharged from the orienting-plate;

(f) means for discharging the bottle from said vertical hole; and

(g) means for effecting a synchronized rotation of said feeding element, delivery element, and orienting-plate.

4,174,776

VIBRATION CONVEYOR APPARATUS

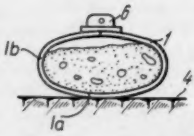
Vladimir I. Kreimer, ulitsa Dershavina, 46, kv. 52; Anatoly Y. Tishkov, ulitsa Dershavina, 19, kv. 67; Vitaly M. Grigoriev, ulitsa Tankovaya, 49, kv. 7; Ljudmila I. Gendlina, ulitsa Pisareva, 4, kv. 64, and Leonid V. Zimonin, ulitsa Borisa Bogatkova, 247, kv. 10, all of Novosibirsk, U.S.S.R.

Continuation of Ser. No. 531,335, Dec. 10, 1974, abandoned.

This application Oct. 1, 1976, Ser. No. 728,777

Int. Cl.[2] B65G *27/00*

U.S. Cl. 198—771 **2 Claims**



1. A vibration conveyor apparatus for feeding granular materials along an inclined channel in a mining excavation having a floor surface comprising:

a flexible and resilient conveying member shaped as a trough having a bottom portion, and curved side portions arranged axially along the flow path of the material to be fed, said member resting on said floor surface and being anchored in at least one point of said inclined channel, said material being conveyed in said bottom portion; and

means for interconnecting said side portions comprising a vibrator.

4,174,777

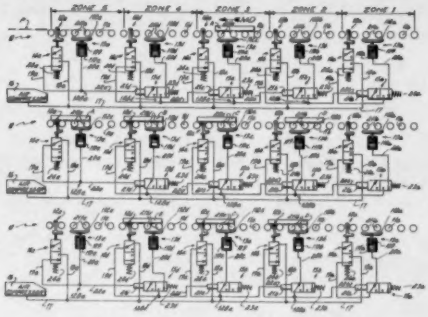
ZERO PRESSURE ACCUMULATING CONVEYOR AND METHOD

Frederick W. Riehle, Jeffersonville, Ind., assignor to A-T-O Inc., Willoughby, Ohio

Filed Feb. 24, 1978, Ser. No. 881,123

Int. Cl.[2] B65G *13/071*

U.S. Cl. 198—781 **26 Claims**



1. A zero pressure accumulator conveyor of the type comprising a plurality of accumulation zones for conveying and accumulating articles, said conveyor comprising:

a plurality of driven article conveying rollers in each zone,

a common drive belt engaging and driving the driven rollers in a zone,

brake means in each zone for selectively engaging at least one driven roller in each zone for braking said one roller to stop an article in said zone, said brake means in a downstreammost zone operating in response to an article sensed in said downstream-most zone, and said brake means in other upstream zones operating in response to both an article sensed in an immediate downstream zone and a different article sensed in the zone to be braked,

said drive belt continually directly engaging all driven rollers in a braked zone and, during operation of said brake means, said drive belt continually and directly engaging all such driven rollers throughout the width of the belt and sliding against said braked roller, the frictional forces thereon being insufficient to drive at least said braked roller.

4,174,778

PACKAGE FOR TUBULAR LAMP

Franciscus M. Klomp, and Josephus H. van Kruijsdijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,068

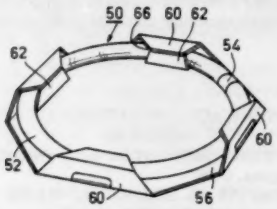
Claims priority, application Netherlands, Jun. 14, 1977, 7706511

Int. Cl.[2] B65D *85/02*

U.S. Cl. 206—303 **4 Claims**

1. A package for a tubular lamp, comprising a flat support member, at least two substantially parallel first creases in said support member, a substantially U-shaped score mark through said support member and encompassing a portion of at least one of said creases, and a further crease across the open ends of said U-shaped score mark, all portions of the flat support mem-

ber with the exception of the portion encompassed by said score mark being bent along said creases in the same angular direction during packaging, the portion of said support mem-



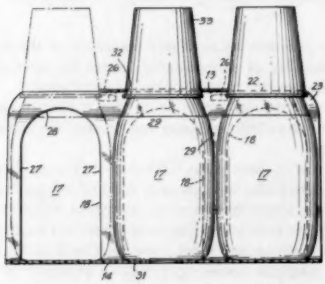
ber between the crease encompassed by the score mark and the closed end of the score mark being bent in the opposite direction.

4,174,779

CARRYING CASE FOR BOTTLES

Adolph Slone, Englewood, N.J., assignor to Schenley Industries, Inc., New York, N.Y.

Filed Jul. 18, 1978, Ser. No. 925,713
Int. Cl.[2] B65D *65/08*
U.S. Cl. 206—427 **8 Claims**



1. A lightweight case for storing and carrying a plurality of bottles in aligned relationship, each of said bottles having a neck, a shoulder and a body, said case comprising:

a one-piece rack member of a rigid, flexible plastic having an elongated bottom face for supporting said bottles, the width of said bottom face being less than the diameter of said body;

a pair of side faces each joined at the bottom edge thereof to a side edge of said bottom face, each side face having apertures each having side edges and a top rim therein for permitting said bodies to protrude therethrough, each side face having a top edge, the height of said side face corresponding approximately to the height of said shoulders above the bottoms of said bottles to be held in said rack; and

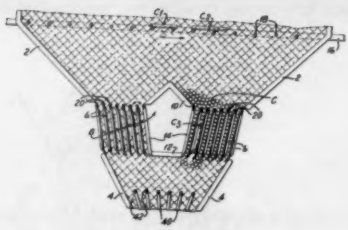
a clip member having first and second spaced-apart clip elements for receiving and holding releasably said top edges of said side faces, the distance between said clip elements being such that said top edges must be displaced toward each other over said shoulders of said bottles for said top edges to be received and held by said clip member, thereby providing for engagement of each by said bottom face and by said side edges and top rim of an aperture in each side face whereby each of said bottles is securely held against accidental dislodgement.

4,174,780

FEEDING CIGARETTES AND SIMILAR ROD-LIKE ARTICLES

David J. Farrar; Robert W. Davies; David C. M. Carter; Reginald C. Bolt, and Robert E. Williams, all of London, England, assignors to Molins Limited, London, England

Filed Jun. 20, 1978, Ser. No. 917,437
Claims priority, application United Kingdom, Jun. 30, 1977, 27509/77
Int. Cl.[2] B07C *5/00, 5/344*
U.S. Cl. 209—536 **11 Claims**



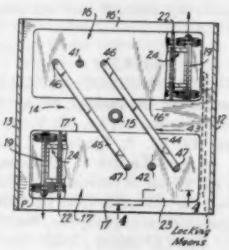
1. Cigarette feeding apparatus comprising a discharge device through which cigarettes are to be discharged at a predetermined rate, and a restraining device upstream of said discharge device through which the cigarettes pass before reaching the discharge device, said restraining device being defined by a plurality of flow channels which are together capable of passing cigarettes at a rate greater than said predetermined rate, each channel having arresting means to arrest any cigarette having at least one class of fault.

4,174,781

DISPENSING APPARATUS

Joseph Hupalowsky, Katonah, N.Y., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Jan. 19, 1978, Ser. No. 870,861
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—49 D **10 Claims**



1. A dispenser apparatus comprising, in combination, a support frame, first and second dispenser modules mounted on said frame, said modules each including an outwardly directed front face and a rear face, a multiplicity of spaced parallel dispenser guides supported on said modules, said guides having a loading end adjacent said rear face and a dispensing end adjacent said front face of said modules and being downwardly inclined from said loading toward said dispensing end, said guides being adapted slidably to support articles to be dispensed, mounting means interposed between said modules and said frame for supporting said modules for movement between a dispensing position whereat the rear faces of said modules are parallel and juxtaposed and, hence, inaccessible, and a loading position whereat said modules are laterally offset, said mounting means comprising first and second vertical pivot means

supporting said modules for rotation about laterally displaced vertical axes, and a parallelogram linkage having first and second ends operably connected to said first and second modules, respectively, the points of connection of each end of said linkage being equi-distant from the pivot axis of the respective module, whereby pivotal movement imparted to one said module imparts concomitant pivotal movement to the other said module, thereby to shift said modules between said loading and dispensing positions.

4,174,782

HOLLOW BODY MADE FROM A THERMOPLASTIC

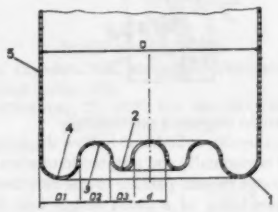
Marc Obsomer, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Feb. 6, 1978, Ser. No. 875,502

Claims priority, application Luxembourg, Feb. 4, 1977, 76704; Mar. 29, 1977, 77042

Int. Cl.² B65D *23/00, 7/42*

U.S. Cl. 215—1 C **16 Claims**



1. In a hollow body made of an oriented thermoplastic material, which body is of generally cylindrical shape and includes a base and a side wall, the improvement wherein said base is oriented and is constituted by between three and 15 concentric annular toroidal sections of substantially semicircular cross section and having alternating directions of curvature from the periphery of said body inwards wherein the radially outermost one of said base sections is upwardly concave and joins directly onto said side wall of said hollow body and the diameter of the cross section of each of said annular sections is less than 20% of the maximum diameter of said side wall.

4,174,783

HOLLOW BOTTLE AND PRODUCTION METHOD THEREFOR

Takashi Abe, Koganei; Kazuo Kudo, Tokyo, and Keiji Kazato, Chiba, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,007

Claims priority, application Japan, Sep. 30, 1977, 52/117735

Int. Cl.² B65D *23/00*

U.S. Cl. 215—1 C **8 Claims**

1. A unitary multi-layer hollow bottle comprising:

an inner layer of polyamide resin;

an outer layer of polyolefin combined with an incombustible inorganic material; and

an intermediate layer of resin adherent to both said inner and outer layers;

said bottle being formed with a pinch-off portion at the bottom, said inner, outer and intermediate layers being substantially continuous throughout the outwardly projecting length of said pinch-off portion.

4,174,784

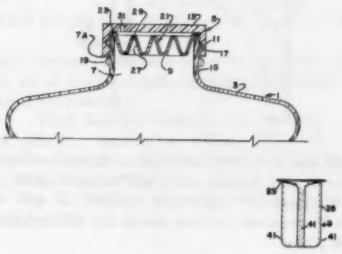
ANTI-COLLAPSE CAP

Philip F. Hartung, 655 Main St., East Greenwich, R.I. 02818

Continuation-in-part of Ser. No. 742,492, Nov. 17, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,436

Int. Cl.² B65D *53/00*

U.S. Cl. 215—349 **6 Claims**



1. A device for preventing the inward deformation by ambient pressure of a container having a hollow walled dispensing spout and relatively thin flexible walls, after said container is filled and sealed, the device comprising a membrane means for sealing the spout, said membrane means including a circumferentially extending flange and a diaphragm extending downwardly therefrom and more flexible than the walls of the container, means for securing the membrane by said flange into sealing engagement with the spout and means for applying the ambient pressure on the outside surface of the walls of the container to the outside surface of the diaphragm, said diaghragm being formed of a relatively thin and flexible side wall which extends from said spout inwardly of said container when secured therein and which terminates in a bottom wall, said side wall being of substantially uniform thickness and having therein a plurality of longitudinally extending peaks and valleys which extend over a substantial length of said wall thereby to form a cross-section of radial star design, said diaphragm being capable of sufficient lateral expansion by said valleys when pressure is applied to said outside surface of said diaphragm to prevent the deformation by ambient pressure of said container after said container is filled and sealed.

4,174,785

MULTIPLE PERIPHERAL SEAL FOR STORAGE TANK FLOATING DECK

Albert C. Garnett, Allentown, Pa., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 29, 1977, Ser. No. 792,448

Int. Cl.² B65D *87/20*

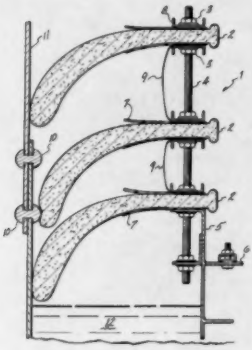
U.S. Cl. 220—224 **8 Claims**

1. A seal for use in a storage tank for volatile liquids, said tank having a tank shell and a floating deck provided with a peripheral edge spaced radially inwardly from said tank shell, comprising:

(a) at least two separate flexible sealing members attached to the peripheral edge of said floating deck, said members being formed from solid resilient material which is impervious to the volatile liquid or vapors within said tank;

(b) securing means secured to the peripheral edge of said

floating tank and secured to said members, said securing means being situated at least in part vertically upwardly from said peripheral edge, said members being individually adjustably attached to said securing means relative to each other in vertical spaced relationship to each other and to said peripheral edge in such a manner as to permit



vertical and horizontal adjustment thereof relative to the surface of said floating deck and to each other, wherein said members are separately secured to said securing means by separate holding means for holding said members in place

to provide an improved, adjustable sealing arrangement which minimizes evaporative losses from the storage tank.

4,174,786

SEAL MEMBER FOR CONNECTING MASTER CYLINDER AND RESERVOIR

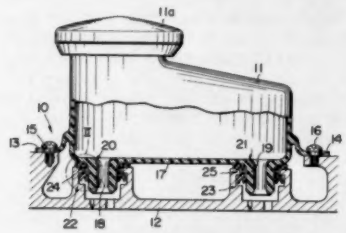
Takashi Fujii, and Jiro Kizaki, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 25, 1978, Ser. No. 899,821

Claims priority, application Japan, Apr. 25, 1977, 52-47525

Int. Cl.[2] F16J *15/32;* **B65D** *53/02*

U.S. Cl. 220—378 **6 Claims**



1. An annular seal member sealingly interposed between and connecting coaxial, telescoped, cylindrical extensions of two members in substantially stationary relative position having different coefficients of thermal expansion, comprising:

one resilient, bifurcated end portion in sealing contact with adjacent surfaces of said extensions of said two members, said one end portion having a plurality of linear projections spaced on the external walls thereof for reducing the contact area with said adjacent surfaces;

a middle portion formed integral with and contiguous to said one end portion, said middle portion being normally separated from either one or both of the adjacent surfaces of said extensions of said two members, and

another resilient, bifurcated end portion formed integral with and contiguous to said middle portion and in sealing contact with said adjacent surfaces of said extensions of said two members.

4,174,787

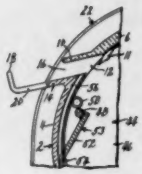
SODA STRAW DISPENSER

John B. Merila, 6223 E. 127th St., Grandview, Mo. 64030

Filed Jun. 7, 1978, Ser. No. 913,485

Int. Cl.[2] B65H *3/56*

U.S. Cl. 221—254 **7 Claims**



1. A soda straw dispenser comprising:

a. a fixed, generally cylindrical hollow drum having its axis disposed horizontally and adapted to contain a large number of straws therein parallel to the axis thereof, each of said straws being of a given length and diameter, and having a downwardly and outwardly inclined chute communicating with the upper forward portion thereof through a longitudinal, horizontal discharge slot thereof,

b. a rotor mounted coaxially in said drum and being axially rotatable therein,

c. a straw carrier consisting of a rod fixed in said rotor and extending parallel to the axis thereof, said rod being spaced apart from the interior surface of said drum by a distance less than the diameter of a single straw, and

d. manually operable drive means operable to turn said rotor from a rest position in which said carrier rod is disposed rearwardly of the vertical midplane of said drum, forwardly around the lower portion of said drum, during which movement a single straw is trapped between said rod and the interior wall surface of said drum, and further in the same direction to a discharge position in which said single straw is elevated to the level of said discharge slot and rolls outwardly by gravity through said chute.

4,174,788

BATCHING PLANT FOR LIME CONCRETE

Bruno Casagrande, Sacile, Italy, assignor to Casagrande & C. S.p.A., Fontanafredda, Italy

Filed Sep. 27, 1977, Ser. No. 837,214

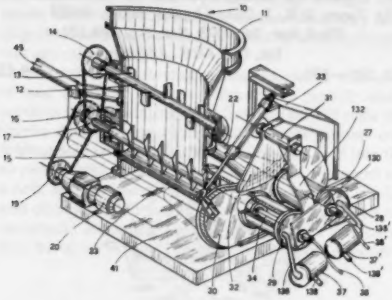
Claims priority, application Italy, Oct. 4, 1976, 83451 A/76; Feb. 7, 1977, 83323 A/77

Int. Cl.[2] F04B *7/00, 15/02*

U.S. Cl. 222—630 **6 Claims**

4. A batching pump for lime concrete comprising a base, a longitudinal displacement feeder attached to said base, said longitudinal displacement feeder being axially displaceable, at least one evacuator conduit attached to said base, at least one cylinder for receiving at one end thereof lime concrete and pumping lime concrete from said cylinder from said same end

to said conduit, the axis of the cylinder being also parallel to the axis of said evacuator conduit, means to pivotally move



said cylinder between said feeder and said conduit, and means to feed pressurized gaseous fluid to said cylinder.

4,174,789

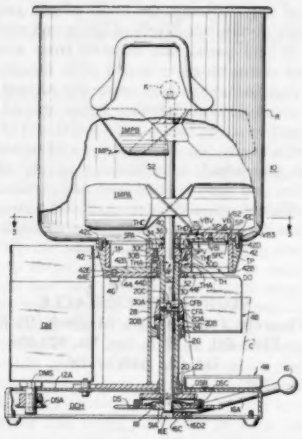
SOUP DISPENSER

John B. West, Glyndon, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Aug. 25, 1977, Ser. No. 827,678

Int. Cl.[2] G01F *11/22*

U.S. Cl. 222—240 **20 Claims**



1. A dispensing assembly for dispensing one or more incremental volumes of liquid or semi-liquid food product from the bottom of a reservoir by gravity filling and emptying, comprising:

a rotary dial shaped plate means having a circular pattern of substantially identically configured measuring chambers formed therin and extending therethrough parallel to a central axis of rotation;

a conformal housing for said dial plate means open at its top and having a supporting web across the bottom thereof coextensive with said dial plate means, said supporting web having a discharge opening formed therein of substantially identical configuration as said measuring chambers for successive registry therewith in response to rotations of said dial plate means on said central axis of rotation within said housing; and

sealing plate means fixed from rotation on said housing over said dial plate means having a fixed hub portion and a sealing portion, the latter overlying an area on said dial plate means coincident with the said discharge opening and surface areas adjacent thereto and greater than the cross-sectional area of a said measuring chamber;

said fixed hub portion being diametrically opposite said sealing portion and of a lesser radial extent;

a first vent port in said sealing plate means adjacent said fixed hub portion;

said dial plate means including a central hub portion coaxial with said fixed hub portion and having a vent chamber and a an annular vent port therein communicating with each measuring chamber and positioned in registration with said first vent port; and

said sealing portion including a second vent port interconnected with said first vent port and said vent chamber and annular vent port in said central hub portion and in registry with said discharge opening through successive ones of said measuring chambers.

4,174,790

SPRAYER USABLE IN BOTH ERECT AND INVERTED STATES

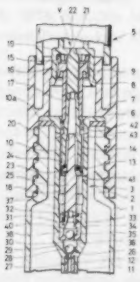
Takamitsu Nozawa; Takayuki Goto; Takao Kishi, and Shigeo Iizuka, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 894,918

Claims priority, application Japan, May 12, 1977, 52-60424[U]; May 18, 1977, 52-57448; Jun. 6, 1977, 52-74188[U]; Aug. 20, 1977, 52-111638[U]

Int. Cl.[2] B05B *9/043, 11/02;* G01F *11/36*

U.S. Cl. 222—321 **17 Claims**



15. A pump mechanism for a sprayer usable in both erect and inverted positions comprising a liquid container and a pressure means including a pressure chamber formed from a cylinder and a piston for sucking up the liquid from the liquid container and pressurizing said liquid for spraying it from the nozzle hole, a piston mounting member extending upwardly from said piston, said pump mechanism comprising a liquid suction hole provided such that it will be positioned slightly below the location of the piston in the cylinder when the pressure chamber becomes largest in its capacity, said suction hole being designed to allow suction of the liquid when the sprayer is in its inverted position, a skirt member provided slightly above that position of the piston mounting member which corresponds to said suction hole when the pressure chamber is maximized in capacity, said skirt member contacting air tightly against the cylinder, a small cylindrical member extending downwardly from the lower end of the cylinder and communicated with the pressure chamber, a valve body fitted on said small cylindrical member, a first check valve provided either in said small cylindrical member or in said valve box for allowing liquid flow into the pressure chamber alone, and a second check valve arranged in countercurrent relation to said first check valve, whereby the valve hole in the valve seat is not closed by the ball valve of the first check valve when the liquid is sucked into the pressure chamber through the first check valve with the sprayer being in its erect position.

4,174,791
LIQUID-GAS PUMPING APPARATUS

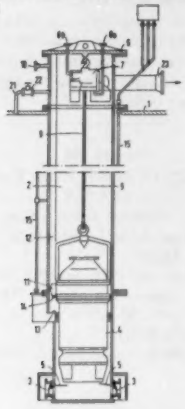
Bruno Auchter, Mainz; Karl-Heinz Wagner, Rauenthal; Günter Glimm, and Manfred Preiss, both of Erlangen, all of Fed. Rep. of Germany, assignors to Rheinhütte vorm. Ludwig Beck & Co., Wiesbaden-Biebrich and Siemens Aktiengesellschaft, Munich, both of, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,690

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707042

Int. Cl.[2] B67D *5/04*; F04B *35/04*

U.S. Cl. 222—333 5 Claims



1. In a liquid-gas pumping apparatus for pumping cryogenic liquids from a storage tank, said apparatus including a vertical housing extending into said tank which functions as a pumping line, an immersion pump and motor unit which is slidably insertable into said housing, and valve means disposed at the lower end of said housing which opens when said immersion pump and motor unit is lowered into said housing and closes when said pump and motor unit is raised in said housing, the improvement comprising

means, disposed at the vertically upper end of said housing, for lowering said immersion pump and motor unit into an operating position in said housing and for lifting said immersion pump and motor unit from said operating position;

a plurality of said valve means, disposed adjacent the bottom of said housing and opening laterally through said housing, said valve means being uniformly distributed over the circumference of said housing, at least one of said valve means being disposed in said housing and adapted so as to be engaged first by said immersion pump and motor unit before the other of said valve means when said pump and motor unit is lowered in said housing into said operating position, said one of said valve means thereby being opened first before the other of said valve means upon engagement with said immersion pump and motor unit;

electrical supply line means extending from the exterior of said housing through said housing into the interior thereof;

first electrical contact means disposed in said interior of said housing and coupled to said electrical supply line means; and

second electrical contact means mounted on said immersion pump and motor unit and adapted to engage said first electrical contact means and establish an electrical connection between said immersion pump and motor unit and said electrical supply line means when said immersion pump and motor unit is lowered into said operating position in said housing.

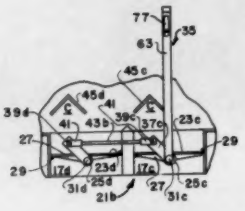
4,174,792
DISPENSING APPARATUS FOR A VEHICLE HAVING CLOSURE GATE CLEARING MEMBER

Eldon D. Jones, R.R. 2, Lake Crystal, Minn. 56055

Filed Apr. 24, 1978, Ser. No. 899,121

Int. Cl.[2] A01C *15/06*

U.S. Cl. 222—608 9 Claims



1. In a vehicle for hauling and dispensing a particulate material including body portion for holding said particulate material and a means of elevating said body portion above ground level, said body portion including a floor, walls extending upwardly from said floor, a dispensing orifice in said floor and a dispensing means located in said orifice for selectively opening and closing said orifice thereby to allow or prevent flow of said particulate material from said body portion, said dispensing means comprising a rotatable dispensing gate extending across said orifice, means for rotating said gate about a point intermediate its ends, one of said ends of said gate thereby being rotated upwardly and the other of said ends being rotated downwardly for selectively opening said orifice to allow dispensing of said particulate material from said body, the improvement comprising a concave plate member extending laterally across and above said upwardly rotated end of said gate, said concave plate member being spaced sufficiently above said end to allow said gate to rotate and of a size sufficient to form a cavity proximally above said upwardly rotated end of said gate which is sufficiently devoid of particulate material when said body is filled with said particulate material to allow sufficient upward rotation of said upwardly rotated end to initiate dispensing of said material through said orifice.

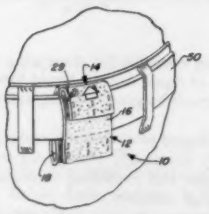
4,174,793
STORAGE RECEPTACLE

Sigmund Wisowaty, P.O. Box 601, Medinah, Ill. 60157

Filed Jul. 3, 1978, Ser. No. 921,486

Int. Cl.[2] A45C *1/04*

U.S. Cl. 224—240 1 Claim



1. A storage receptacle provided with a plurality of storage compartments, comprising,

a length of material having opposed ends and a substantially centrally positioned fold line,

said fold line permitting said length of material to be folded about said fold line thereby to create substantially equal sections about said fold line,

each of said substantially equal sections including at least one discrete storage compartment, each of said storage compartments provided with a closure flap,

fastening means interposed between each of said closure flaps and each of said corresponding storage compartments such that each of said closure flaps may be disengageably fastened to enclose each of said corresponding storage compartments,

and disengageable fastening means associated with said ends of said length of material thereby to permit said equal sections to be disengageably fastened at said ends thereof,

whereby said storage receptacle may be folded over by folding said length of material along said fold line thereby to permit said equal sections to encircle a support such as a belt, and fastening the storage receptacle in position by said disengageable fastening means whereby such storage receptacle including each of said storage compartments may be securely held in position about the support.

4,174,794

VEHICLE ARTICLE CARRIER

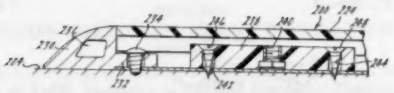
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 725,500, Sep. 22, 1976. This application May 19, 1977, Ser. No. 798,576

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] B60R *9/00*

U.S. Cl. 224—320 **14 Claims**



1. In an article carrier for an automotive vehicle:

an article supporting slat mounted on a portion of the vehicle having a lower surface, upwardly extending sidewalls having converging portions, and an article supporting upper surface, said article supporting upper surface containing an elongated opening therein;

a fastening element located within said slat and fixedly secured with respect thereto and securing means associated with article carrying means, said fastening element being adapted to secure said securing means in order to attach said article carrying means to said article supporting slat;

a cover member normally disposed in an operative position partially within said elongated opening, and closing at least a portion of said opening, said cover member being at least partially removable to an inoperative position; and

said fastening element being at least partially concealed from view when said cover member is disposed in said operative position and being accessible at such time as said cover member is moved to said inoperative position.

4,174,795

PANNIER MOUNTING ARRANGEMENT FOR CYCLES

W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich. 48104, and Leslie E. Bohm, 29560 Rutherland North, Southfield, Mich. 48076

Filed Feb. 14, 1977, Ser. No. 768,467

Int. Cl.[2] B62J *9/00*

U.S. Cl. 224—32 A **15 Claims**

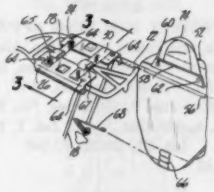
1. A mounting arrangement for mounting a luggage item such as a pannier or the like onto a cycle vehicle having a rear wheel comprising:

an elongated element;

a channel section adapted to slidably receive and support said elongated element therein along the length of said channel section;

means mounting one of said elongated element or said channel section to said luggage item, extending along said luggage item;

means securing the other of said channel section or said elongated element to said cycle vehicle extending adjacent said rear wheel in a longitudinal direction substantially parallel to the length of said cycle, whereby said luggage item may be mounted to or removed from said cycle by fore and aft sliding movement of said elongated element into said channel section to suspend said luggage



item so as to distribute the weight of said luggage item along the length of said elongated element;

means releasably securing said luggage item to structure carried by said cycle so as to prevent relative fore and aft sliding movement of said channel section and said elongated element.

4,174,796

REAR CARRIER DEVICE ON MOTORCYCLES AND THE LIKE

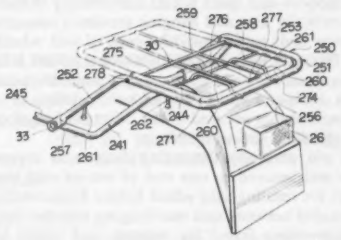
Nagatoshi Nakamura, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,192

Claims priority, application Japan, Jan. 19, 1977, 52/4981[U]; Jan. 19, 1977, 52/4982[U]

Int. Cl.[2] B62J *7/04*

U.S. Cl. 224—39 **7 Claims**



1. A rear carrier device for a cycle, comprising:

a generally U-shaped rear stay member;

said rear stay member being connected in the right and left front end parts thereof to the sides of the cycle frame, together with the fastening means of the right and left rear cushion or shock absorber units of said cycle;

said device including an intermediate part and a rear part extending substantially over a rear fender of said cycle;

a suspended part provided in said intermediate part of said device, said suspended part being connected to said rear fender of said cycle;

a carrier member connected in the forward side portions thereof respectively to both side parts of said stay;

said carrier member comprising a main frame connected with said rear stay and a sub-frame pivotally fitted to said main frame and formed so as to be selectively rotated between a first position and a second position relative to said main frame;

said sub-frame being provided with a general dimension which is smaller than the dimension of said main frame;

said first position of said sub-frame comprising a position wherein said sub-frame is housed within said main frame and forms a substantially flat carrying surface with said main frame; and

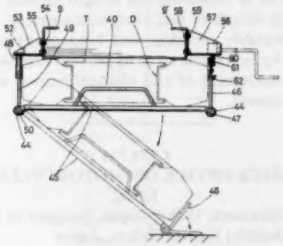
said second position of said sub-frame comprising a position wherein said sub-frame is extended in a direction substantially opposite to said first position, on the seat side of said cycle, to substantially increase the size of said substantially flat carrying surface.

4,174,797

SPARE WHEEL HOLDING APPARATUS

Setsuo Yasue, Gifu, and Tomio Yamamoto, Aichi, both of Japan, assignors to Sankokiki Kabushiki Kaisha, Inazawa, Japan

Division of Ser. No. 811,865, Jun. 30, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,870
Claims priority, application Japan, Jul. 1, 1976, 51-78020
Int. Cl.[2] B62D *43/04*
U.S. Cl. 224—42.21 **8 Claims**



1. An apparatus for holding a spare wheel under the chassis of a motor vehicle, said chassis having two longitudinal members, said apparatus comprising:

an elongated wheel supporting frame adapted to be positioned perpendicularly to said longitudinal chassis members to support said spare wheel horizontally thereon;

a pair of vertically disposed hanging members connected at their lower ends to the opposite ends of said wheel supporting frame to form therewith a wheel holder which is rotatable about one end both vertically and horizontally to move its other end vertically and horizontally;

a supporting member secured to the outer surface of one of said longitudinal chassis members;

a vertical pin pivotally depending from said supporting member and secured to one end of one of said hanging members for rotating said wheel holder horizontally;

means provided between said one hanging member and said wheel supporting frame for rotating said wheel holder vertically;

means provided between the other hanging member and said wheel supporting frame for rotating said other hanging member vertically; and

means provided on the outer surface of the other longitudinal chassis member for moving said other end of said wheel holder vertically between an upper position adjacent to said chassis and a lower position on the ground, wherein said wheel holder can be moved to a position below and outside of the motor vehicle.

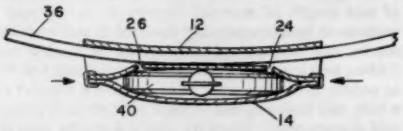
4,174,798

PORTABLE POCKET FOR POCKET WATCHES

Ray E. T. Pollard, 5941 La Jolla Mesa Dr., La Jolla, Calif. 92037

Filed Oct. 27, 1977, Ser. No. 845,888
Int. Cl.[2] A45C *11/10*
U.S. Cl. 224—253 **3 Claims**

1. A portable watch pocket, said pocket comprising: a first elongated sheet of rugged, pliable material having generally parallel sides and rounded ends folded over with the ends secured together for defining a belt receiving loop, and a second sheet of rugged, pliable material having the general size and configuration of one half of the first elongated sheet with a rounded end, a generally straight end and two sides edges, said second sheet secured along its two sides and rounded end to said first sheet thereby defining an upwardly opening pocket, wherein one wall of said pocket is defined by said first sheet and the other wall is defined by said second sheet, and a



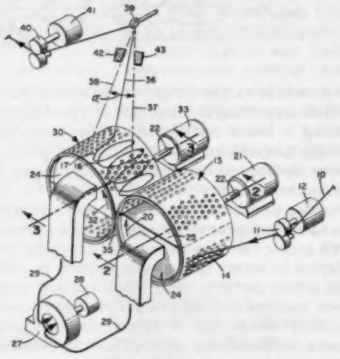
pair of spaced apart independent vertical slits formed in said one wall of said pocket for creating a bowing effect when the watch pocket is strapped to a body so that the sides of the upwardly opening pocket move inwardly toward one another for gripping the edge of a watch therein.

4,174,799

SYSTEM FOR THE TEMPORARY STORAGE OF YARN

Armando d'Agnolo, Porcia, Italy, assignor to Officine Savio S.p.A., Pordenone, Italy

Continuation of Ser. No. 716,558, Aug. 23, 1976. This application Jul. 1, 1977, Ser. No. 812,388
Claims priority, application Italy, Aug. 28, 1975, 83431 A/75
Int. Cl.[2] B65H *23/22*
U.S. Cl. 226—7 **2 Claims**



1. A process for temporarily storing random continuous yarns in a relaxed state in which inversion of the yarn takes place comprising randomly laying up yarn on a first moving partitioned perforated drum, bringing a second partitioned perforated drum into close proximity with said first drum but spaced therefrom, transferring said randomly laid up yarn upwardly from said first drum to said second drum in inverted form where said drums are in close proximity, removing said yarn from said second drum and monitoring the yarn on said second drum thereby to regulate the supply of yarn to said first drum as well as its removal from said second drum.

4,174,800

STORAGE ROLLER THRUSTER DEVICE FOR CONTINUOUS STRIP PAPER FEEDERS

Manuel M. Torres, Avda. Sancho el Fuerte, 21-80C, Pamplona, Spain

Filed Jan. 9, 1978, Ser. No. 867,817
Claims priority, application Spain, Jun. 25, 1977, 229.538
Int. Cl.[2] B65H *17/42*
U.S. Cl. 226—113 **2 Claims**

1. A storage roller thruster device for continuous strip paper feeders, said storage roller being carried by a chain having at least one axle associated therewith, peculiar inasmuch that it is

comprised of an inertia flywheel mounted on an axle, which is mounted in a manner that it is free to revolve with respect to its axle, and where said flywheel is positioned in between two discs equipped with friction linings on their respective faces flanking said flywheel, and which are rotationally attached to the axle, but are able nevertheless to undergo certain axial displacement, and where one of said discs is coupled on its opposite face with means which are provided for exerting a fluid pressure, and where the assembly is equipped with a

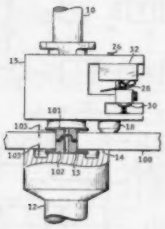
pinion that is rotationally attached to the axle, all this in such a manner that there is gear engagement with an axle belonging to the chain that carries the storage roller to which the device is applied, and where the inertia flywheel is related to a means for transmitting rotation in synchronism with the speed at which the paper strip is being fed, and where, when the thruster means operate, the flywheel becomes engaged and instantaneously thrusts the paper storage roller at the same speed as that of the paper being supplied.

4,174,801

HOLLOW CORE PANEL INSERT INSTALLATION DEVICE

Charles L. Holland, Escondido, and Steven S. Hardy, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 9, 1978, Ser. No. 932,255
Int. Cl.² B21D *47/04*
U.S. Cl. 227—4 **4 Claims**



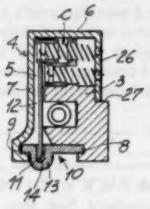
1. A press anvil position control comprising:
a lower anvil adapted to be located on a first side of a panel workpiece;
an upper anvil adapted to be positioned adjacent to the second side of said workpiece opposite said lower anvil;
said anvils adapted to relative movement toward and away from each other;
a compensator body mounted on said upper anvil for movement therewith;
a pin slidably mounted on said body for reciprocating movement substantially parallel to the path of anvil relative movement, said pin adapted to contact a workpiece between said anvils as said anvils undergo relative movement toward each other;
a switch bar mounted on said pin with its major axis substantially normal to said pin; and
a limit switch mounted on said body and disposed for operation by said switch bar after said pin contacts said workpiece during relative movement of said anvils toward each other; whereby said switch may control said anvil movement to stop said movement with said anvils at a selected position relative to said workpiece.

4,174,802

MAGAZINE DEVICE FOR CONTINUOUSLY FEEDING NAILS INTO A NAIL DRIVING MACHINE

Bruno Maestri, Via Foppa, 26, Milano, Italy

Continuation of Ser. No. 779,509, Mar. 21, 1977, abandoned. This application Mar. 23, 1978, Ser. No. 889,294
Claims priority, application Italy, Mar. 24, 1976, 21544 A/76
Int. Cl.² B25C *3/00*
U.S. Cl. 227—109 **4 Claims**



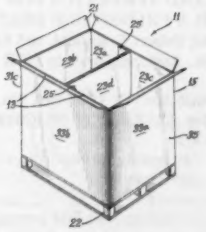
1. An improved magazine device for continuously feeding nails into a nail driving device comprising a first side frame and a second side frame defining therebetween a nail guide passage to guide the nails towards a drive channel, means for connecting and disconnecting said side frames from each other provided at the ends thereof, and a slidable member housed between said side frames to enable insertion of a nail strip into said guide passage, said slidable member being provided on its inner face facing the guide passage with a substantially longitudinal slot suitable for receiving the points of the nails, and said means for connecting and disconnecting said side frames from each other comprising means for adjusting the distance between said side frames and thereby said guide passage to accommodate nails of varying diameters.

4,174,803

MULTICELL CORRUGATED BULK CONTAINER

Michael J. Shrontz, Ingalls, and Robert M. Harvey, New Palestine, both of Ind., assignors to Inland Container Corporation, Indianapolis, Ind.

Filed Jul. 12, 1977, Ser. No. 814,972
Int. Cl.² B65D *3/24, 5/56*
U.S. Cl. 229—15 **9 Claims**



1. A reusable bulk container for shipping granular products or the like, which container includes
a pair of rectangular tubular cells each of which is formed from four serially connected panels of corrugated fiberboard having vertical flutes and having flap means at one end, and an outer rectangular sleeve surrounding said cells and disposed in continuous surface-to-surface contact with the outside surfaces of six panels of said pair of cells, said sleeve including four serially connected rectangular panels joined along three vertical score lines which panels carry depending flaps for closing the bottom of the container defined by a transverse score line, said sleeve inside surface being adhesively joined to said outside surfaces of

said six cell panels by an adhesive pattern which covers a major portion of surface area of each of said sleeve panels, wherein the improvement comprises

said flap means of each tubular cell being formed as a manufacturer's joint by attachment to the inside surface of the panel at the other end of said serially connected panels, said adhesive pattern crossing said three vertical score lines of said sleeve so as to unite the side edges of said cells tightly to the side edges of said sleeve in three of the four corners, and the lateral ends of said sleeve being joined to each other by a manufacturer's joint that is disposed exterior of the sleeve so as to tightly unite said sleeve to said cell in the fourth corner and thereby provide uninterrupted contact between said sleeve inside surface and said cell outside surfaces about the entire perimeter of the bulk container.

4,174,804

SYMMETRICAL SACK WITH DOUBLE SIDE FOLDS

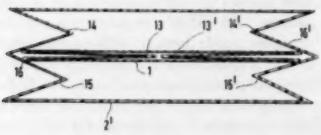
Frank Bosse, Tecklenburg, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed May 9, 1978, Ser. No. 904,320

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721771

Int. Cl.[2] **B65D** *33/02;* **F15B** *15/22*

U.S. Cl. 229—55 **3 Claims**



1. A symmetrical tubular sack with double side folds comprising a supporting outer sack and a sealing inner sack of thermoplastic film, the outer sack comprising a woven circular fabric tube section of stretched plastic tapes separate from the inner sack and provided with double side folds, and the inner sack comprising a tube section provided with a single side fold and placed in the outwardly directed fold located between the double side folds of the outer sack.

4,174,805

METHOD AND APPARATUS FOR TRANSMITTING DATA TO A PREDEFINED DESTINATION BUS

Robert G. Fulks; Robert E. Enfield, and Edward H. Greenwood, all of Phoenix, Ariz., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 13, 1978, Ser. No. 895,891

Int. Cl.[2] **G06A** *11/00;* **G01R** *31/00*

U.S. Cl. 235—302 **32 Claims**

1. A tester for testing printed circuit boards, said tester comprising in combination:

(a) a first processor;

(b) a bus connected to said first processor;

(c) a plurality of sensor/driver circuits each having an input-/output terminal;

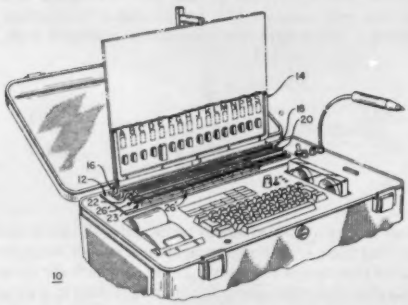
(d) means for storing information defining which outputs of said tester are destinations of the respective bits of a data word in said processor;

(e) a parallel and serially loadable shift register capable of both serial and parallel output coupled to said bus;

(f) means for transferring said data word in parallel format from said processor into said shift register and transferring information in parallel format from said shift register into said processor;

(g) means for serially shifting bits of said data word out of said shift register and for serially shifting information into said shift register;

(h) means for gating said serially shifted bits to data input-/output terminals of ones of said driver/sensor circuits selected in accordance with said stored destination-determining information and for gating information received from said data input/output terminals to said shift register; and



(i) means for transmitting said bits from the input/output terminals of the driver/sensor circuit to predetermined pins of said printed circuit boards.

4,174,806

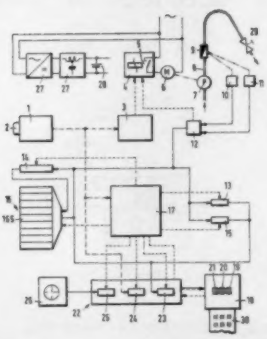
RECORDING DEVICE FOR THE DISPENSING OF GOODS

Ulrich Zahn, Bollstrasse 32, 3076 Worb, Switzerland

Filed Aug. 2, 1978, Ser. No. 930,342

Int. Cl.[2] **G07F** *7/08*

U.S. Cl. 235—381 **2 Claims**



1. Recording device for the dispensing of goods, especially liquid automative fuel, comprising

a scanning or reading device **(1)** for information carriers **(2)** serving as credit cards, bearing customer identification numbers individually correlated with the customers;

at least one dispensing unit **(6, 7, 8, 29)** for the goods, which is blocked in the rest condition and is unblocked by the reading device after reading one of these customer ID numbers;

a pulse generator **(9, 10, 11, 12)** which generates counting pulses during the dispensing of the goods, each of these counting pulses corresponding to a predetermined counting unit of the quantity of goods or a corresponding price unit;

a pulse counter **(13)** counting upon each dispensing of goods the thus-produced counting pulses, respectively starting with its zero setting; and

a recording device **(18)** which records the thus-counted pulses, respectively together with the customer ID num-

ber scanned or read by the scanning or reading device, continuously on a record carrier (30), characterized by

a long-term storage means (16) comprising for each customer ID number a storage cell (e.g. 165) individually associated with this ID number, and

a control circuit (17, 22), which

upon each dispensation of goods effect a transfer of the content of the storage cell (e.g. 165) associated with the customer ID number scanned or read by the scanning or reading device (1) into a second counter (14),

the addition of the counting pulses produced by the pulse generator (9, 10, 11, 12) to the content of this storage cell (e.g. 165) transferred into the second counter (14), and

the transmission of the thus-obtained counter reading (of counter 14) into this storage cell (e.g. 165), and

triggers, upon a control command, a blocking of the scanning or reading device (1),

thereafter triggers directly successive recordings of the content of the individual storage cells (of the long-term storage means 16), respectively together with the associated customer ID number, and

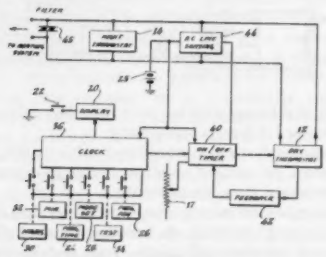
then triggers the unblocking of the scanning or reading device (1).

4,174,807

AUTOCYCLING CONTROL CIRCUIT FOR HEATING AND/OR AIR CONDITIONING SYSTEMS

Arthur W. Smith, 4 Dempsey Ct., Ansonia, and George D. Kimble, Curtis Ave., New Fairfield, both of Conn. 06401

Filed Aug. 10, 1978, Ser. No. 932,422
Int. Cl.[2] F23N *5/20*
U.S. Cl. 236—47 **10 Claims**



1. An autocycling control circuit means for automatically controlling the activation of a heating system comprising, in combination,

(a) first and second thermostat means, said second thermostat being set at a higher temperature than said first thermostat,

(b) means for continuously coupling said first thermostat means to said heating system for continually maintaining a minimum temperature in accordance with the setting of said first thermostat, and

(c) programmable timer means for selectively controlling the coupling of said second thermostat to said heating system during settable, predetermined time intervals,

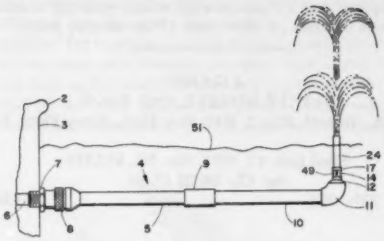
(d) said programmable time means including a control means coupled to said second thermostat for selectively enabling and disabling said second thermostat during said predetermined time intervals in accordance with whether said second thermostat is calling for heat.

4,174,808

POOL FOUNTAIN

Edward Latin, 5357 Ridgevale Way, Fair Oaks, Calif. 95628

Filed Oct. 25, 1977, Ser. No. 844,615
Int. Cl.[2] B05B *17/08*
U.S. Cl. 239—23 **9 Claims**



1. A fountain for a swimming pool comprising:

(a) an extended tubular arm having a quick disconnect flow through valve connectable on one side to an underwater swimming pool water inlet on the first end of said arm,

(b) hollow means for altering the path of fluid flow from generally horizontal to generally vertical connected on one side to the other end of said arm,

(c) an orientable flow through ball valve disposed between and connected to said hollow means on one end,

(d) a jet pump having at least one aperture, and being connected at one of its two ends to said ball valve, said pump including a rotatable collar to adjustably close the apertures of said pump,

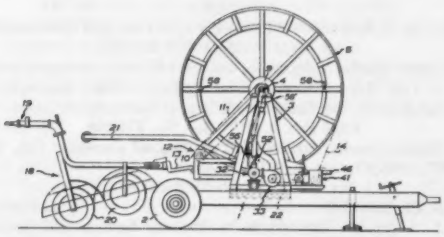
(e) a rigid riser generally vertically disposed and having a first end and a second end; the first end connected to said jet pump's second end, all of said parts communicating to form a conduit for a stream of water.

4,174,809

IRRIGATION MACHINE

Jan M. Arlemark, Skansgatan 18, 272 00 Simrishamn, Sweden

Filed Oct. 21, 1977, Ser. No. 844,306
Claims priority, application Sweden, Oct. 22, 1976, 7611743; Nov. 16, 1976, 7612780; Apr. 26, 1977, 7704768
Int. Cl.[2] B05B *3/18*
U.S. Cl. 239—189 **6 Claims**



1. An irrigation machine with a hose reel rotatably mounted on a wheeled frame for a withdrawable and rewindable hose whose one end fixed to the hose reel is connectable via a coupling to a water supply source, and whose other end is connected to a sprinkler gun on a gun carriage or a sled, the hose reel for the hose, which is compression resistant and consists of rigid hose material, being coupled to a drive motor designed as a water turbine, which drive motor is coupled into a conduit system from the water supply source to the gun, and the hose reel being journalled with its axis of rotation substantially horizontal, wherein said water turbine is coupled into said

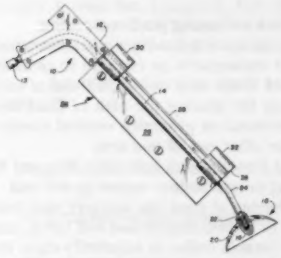
conduit system via a flow-divider in the form of a three-way valve with one inlet and two outlets, said water turbine being coupled in between the two outlets, said flow-divider having a main channel leading from the water supply source to the hose, in which channel there is provided a throttle point, wherein the water turbine is coupled into a branch conduit whose ends are connected to the main channel on either side of the throttle point, said throttle point being adjustable, and a regulator valve disposed in a by-pass conduit whose ends are connected to the main channel on either side of the throttle point.

4,174,810

SAFETY NOZZLE AND RACK

Edward L. Torbett, Rte. 2, P.O. Box 272A, Piney Flats, Tenn. 37686

Filed Oct. 17, 1977, Ser. No. 842,519
Int. Cl.[2] B05B *15/06*
U.S. Cl. 239—283 **3 Claims**



1. A safety nozzle and storage rack assembly for pressurized fluids comprising an elongated conduit having enlarged shoulder means adjacent its outlet extending radially outwardly from the longitudinal axis of said conduit, said conduit being adapted for connection to a source of pressurized fluid, semi-collar means substantially axially surrounding and supporting said conduit proximate to said shoulder means and having a substantially horizontally disposed loading gap lying substantially above the axis of said conduit when said conduit is resting within said semi-collar means, said semi-collar means having an average diameter less than that of said shoulder means such that axial retraction of said conduit from said semi-collar means by the reverse action from fluid ejected from said outlet is prevented.

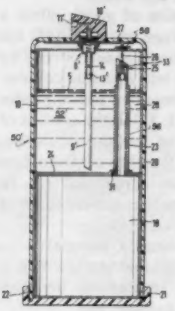
4,174,811

FLUID SUBSTANCE SPRAYER HAVING PROPELLANT GAS AND SUBSTANCE REFILL

Siegfried Binder, Friolzheim, and Karl Herzog, Stuttgart, both of Fed. Rep. of Germany, assignors to Firma Airotechnik Siegfried Binder GmbH, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,198
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706261; Oct. 6, 1977, 2744892
Int. Cl.[2] B65B *31/00*; B65D *83/14*
U.S. Cl. 239—308 **12 Claims**

1. A sprayer for substances, such as liquids, and pastes, comprising a first container having a top with a spray fitment thereon, said spray fitment including a delivery conduit terminating in a spray nozzle discharge, a discharge valve associated with said fitment mounted on said first container and being actuable by said fitment to open and close the top of said first container, a lifting tube connected to the top of said first container and to said discharge valve and having a lower end extending downwardly into the substance to be sprayed, a pressure gas fill-up valve mounted in said first container having an opening for the inflow of a pressure gas into said first container for pressurizing the substance to flow up said lifting, tube through said discharge valve and through said delivery conduit for spraying out through said nozzle and including means for adding a pressure gas into the substance which flows out through said discharge valve and said nozzle, said first container including an opening in the bottom thereof, a pressure gas container having a top with a delivery tube extending



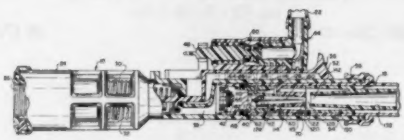
outwardly therefrom into the opening of said container in pressure-sealed engagement therewith, said fill-up valve comprising a delivery valve in said delivery tube and means for actuating said delivery valve.

4,174,812

JET PUMP PROPORTIONERS

Valentine Hechler, IV, 26 Meadow View Rd., Northfield, Ill. 60093

Continuation-in-part of Ser. No. 716,896, Aug. 23, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,677
Int. Cl.[2] B05B *7/30*
U.S. Cl. 239—318 **13 Claims**



1. A multi-stage solution proportioning, mixing and dispensing device for liquids comprising:

a housing having a pressurized solvent inlet, a solute inlet and a pressurized solution discharge opening having determined flow characteristics;

a plurality of mixing means between said inlets and said discharge opening, each mixing means defining a confluence chamber and mixing zone and having a nozzle receiving solvent under pressure from said inlet, each nozzle having converging side walls to convert pressure on the flowing solvent to kinetic flow energy and terminating in a jet flow port opening separately into the respective chambers, one of said port openings having fixed flow characteristics;

solute conduit means connecting the solute inlet to one of said chambers in free flowing relation;

conduit means conducting the mixture from said one of said mixing means as a solute to the chamber of the other mixing means including an outlet port from the one mixing means disposed in axial alignment with the solvent jet flow port thereto and having a diverging wall therefrom for converting kinetic flow energy of said mixture to pressure and conducting it to the chamber of the other mixing means;

further conduit means conducting mixture from said other mixing means to said discharge opening including an outlet port from the chamber of said other mixing means having a flow area not less than that of said discharge

opening and being disposed in axial alignment with said one of said openings having fixed flow characteristics, and having a diverging wall for converting kinetic flow energy to pressure upon the solution flowing therethrough; and

means axially adjustable in one of said converging wall nozzles for varying the flow characteristics of one of said fixed flow openings to provide a ratio correction for the mixture discharged from the discharge opening.

4,174,813

PNEUMATIC SPREADER WITH PIVOTING SPREADER BARS

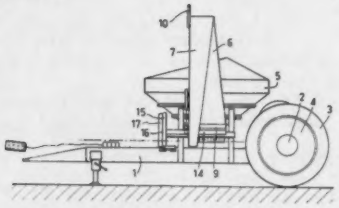
Xavier R. Grataloup, Montereau, France, assignor to Société Anonyme dite: Nodet-Gougis, Montereau, France

Filed Feb. 27, 1978, Ser. No. 881,364

Claims priority, application France, Mar. 4, 1977, 77 06437

Int. Cl.[2] A01C *3/06*

U.S. Cl. 239—655 **5 Claims**



1. A high capacity pneumatic spreader particularly adapted for spreading powdered or granular substances comprising a frame mounted on wheels, a hopper carried by said frame, said hopper having an elevational profile defined in part by a pair of opposite lateral sides, at least one spreader bar carried by said frame, said spreader bar being movable between a first generally horizontal position projecting laterally from said frame beyond one of said sides and a second generally vertical position between said lateral sides, said spreader bar having first and second ends respectively adjacent to and remote from said frame in said first position, an arm positioned between said spreader bar first end and said frame, first pivot means for pivotally connecting said arm to said spreader bar first end for relative pivoting movement about a generally horizontal axis, means for raising said spreader bar to a generally vertical position by pivoting movement of said spreader bar about said first pivot means, second pivot means for pivotally connecting said arm to said frame for relative pivoting movement about a generally vertical axis, and said second pivot means being disposed between said hopper sides whereby said spreader arm can be pivoted about said second pivot means from a generally vertical position laterally outboard of one of said hopper sides to a generally vertical position within said profile and between said hopper sides.

4,174,814

IMPELLER SHOE FOR CENTRIFUGAL IMPACT ROCK CRUSHING MACHINE

Kenneth D. Warren, and Robert G. Tenold, both of Spokane, Wash., assignors to Spokane Crusher Manufacturing Co., Spokane, Wash.

Filed Apr. 3, 1978, Ser. No. 892,886

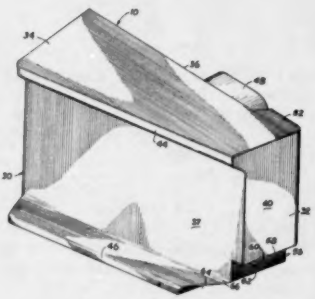
Int. Cl.[2] B02C *13/18*

U.S. Cl. 241—275 **6 Claims**

1. An elongated impeller shoe for mounting to a bracket on a horizontal turntable of a vertical axis centrifugal rock crushing machine to accelerate aggregate radially outward from a central distribution cone to impact against stationary anvils to thereby crush the aggregate, in which the central distribution cone has (1) a top surface for initially receiving the aggregate and directing the aggregate radially outward to the elongated impeller shoe, and (2) an annular peripheral surface that extends downward from the top surface toward the turntable, said elongated impeller shoe comprising:

an elongated body of wear resistant alloy material extending longitudinally from an inner end to an outer end;

said body being of a generally trapeziform shape having (1) a back bearing surface extending longitudinally between the inner end and the outer end and adapted for bearing against such a turntable bracket; (2) a face surface extending longitudinally between upper and lower longitudinal channel lips from the inner end to the outer end and adapted for receiving and directing aggregate therealong; (3) an outer end surface extending transversely between the face surface and to the back bracket mounting surface; and (4) an inner end surface extending transversely between the face surface and the back bearing surface;



said face surface being formed at an acute angle of between 10 and 12 degrees with respect to the back bearing surface and being formed at an obtuse angle with respect to the inner end surface;

said inner and outer end surfaces being formed at acute angles with respect to the back bearing surface;

said inner end having a transverse notch formed therein intersecting the inner end surface and the face surface including the lower channel lip that is complementary to such a top surface and such an annular peripheral surface of the central distribution cone to enable the inner end of the body to extend over such an annular peripheral surface with the inner end surface overlying a portion of such a top surface of the central distribution cone.

4,174,815

APPARATUS FOR WINDING ARMATURES

Raymon H. Dammar, Minneapolis, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Continuation of Ser. No. 557,363, Mar. 11, 1975, abandoned. This application May 9, 1977, Ser. No. 795,374

Claims priority, application United Kingdom, Mar. 19, 1974, 12132/74

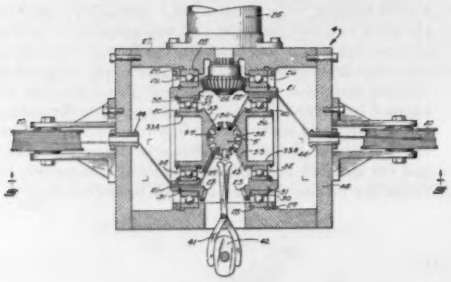
Int. Cl.[2] H02K *15/04*

U.S. Cl. 242—7.05 B **125 Claims**

1. An apparatus for winding coils of wire on a core of an armature, said core having a longitudinal axis and a plurality of slots for accommodating coils of wire comprising:

means for holding the armature in a predetermined position, housing means located adjacent opposite sides of the armature when the armature is held by the means for holding the armature, first annular means rotatably mounted on the housing means about an axis generally normal to the longitudinal axis of the core adjacent one side of the core, second annular means rotatably mounted on the housing means about an axis generally normal to the longitudinal axis of the core adjacent the side opposite the one side of the core, said first and second annular means each having means for receiving wire from a supply of wire and locating the wire adjacent the core so that

the wire can be wound on the core, drive means to rotate the first annular means in a first circumferential direction and to rotate the second annular means in the opposite circumferential direction, first means for guiding the wire



moving from the first annular means into a first pair of slots in the core to form a first coil on the core, and second means to guide the wire moving from the second annular means into a second pair of slots in the core to form a second coil on the core.

4,174,816

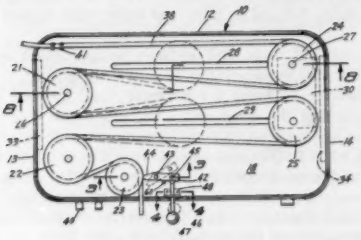
STERILE SURGICAL CORD AND TUBE RETRACTOR

Leslie C. Olson, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 6, 1973, Ser. No. 367,640

Int. Cl.[2] B65H *75/36*

U.S. Cl. 242—47.5 **4 Claims**



1. A retractor for elongated flexible linear tube and cord elements used in surgical procedures, said retractor comprising:

(A) a horizontally disposed housing having vertical end walls and side walls and a removable top tray,

(B) a plurality of stacked horizontal parallel vertically spaced apart retractor plates within said housing,

(C) a plurality of laterally spaced apart peripherally grooved wheels fixedly mounted on the top side of each of said retractor plates adjacent one end thereof, said wheels being journaled for rotation about vertical axes,

(D) a plurality of laterally spaced apart peripherally grooved wheels movably mounted on the top side of each of said retractor plates adjacent the opposite end thereof for reciprocable movement relative to said fixedly mounted wheels, said wheels being journaled for rotation about vertical axes,

(E) a plurality of longitudinal slots in each of said retractor plates in number corresponding to said reciprocable wheels, said reciprocable wheels being mounted for movement in said slots,

(F) resilient tension means connected to said reciprocable wheels for normally urging said wheels away from said fixedly mounted wheels,

(G) a further peripherally grooved wheel fixedly mounted on the top side of each of said retractor plates adjacent one side edge of said plate between the first mentioned fixedly mounted wheels and reciprocable wheels,

(H) a first opening in said housing for entry of a linear element to each of said retractor plates,

(I) fastening means on each of said retractor plates adjacent said entry opening for securing a linear element to each plate, whereby, when said linear element is threaded in a serpentine path around said reciprocable and fixedly mounted wheels, said fastening means resists pulling tension on the free end of said element sufficient to cause movement of the reciprocable wheels toward the fixedly mounted wheels resulting in shortening of the serpentine path and extension of the element, and

(J) a further exit opening in said housing adjacent each said further fixedly mounted wheel.

4,174,817

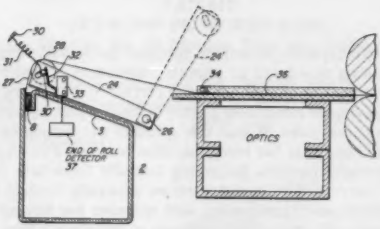
END OF ROLL DETECTOR

Daniel H. Robbins, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.

Division of Ser. No. 730,758, Oct. 6, 1976, abandoned. This application Jun. 30, 1978, Ser. No. 920,765

Int. Cl.[2] B65H *25/04*

U.S. Cl. 242—57 **8 Claims**



1. In combination:

a. a film partridge, including exit orifice means;

b. film transport means for conveying photosensitive material from said exit orifice means, said film transport means having support means which enable said film transport means to be translated transverse the film path established by said film transport means; and

c. detector means associated with said film transport means for detecting said translation of said film transport means upon the exhaustion of photosensitive material contained within said cartridge.

4,174,818

GUIDANCE SYSTEMS FOR MOBILE CRAFT

Stephen J. Glenn, East Hanningfield, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Jan. 14, 1977, Ser. No. 759,535

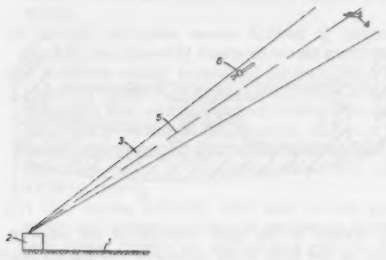
Claims priority, application United Kingdom, Jan. 29, 1976, 3581/76

Int. Cl.[2] F41G *7/14, 9/00, 11/00;* G01S *1/00*

U.S. Cl. 244—3.13 **17 Claims**

1. Apparatus for guiding a craft comprising, means for projecting a beam of electromagnetic energy along a beam path to be followed by a moving craft, means for making different parts of the beam distinctive as to predetermined modulation parameters thereof from other parts so that the craft may establish in what part of the beam it is located, and means for

imposing on the beam a code which contains data concerning the movement of the beam path whereby the craft may establish in what direction it should move to remain under the control of the beam.



4,174,819

CONTROLLER FOR THE ATTITUDE STABILIZATION OF A SATELLITE

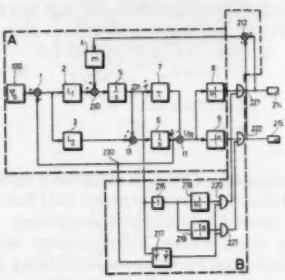
Ernst Brüderle, Ottobrunn; Eveline Gottzein, Oberpfraumern, and Helmut Bittner, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,531

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732201

Int. Cl.[2] B64G 1/20

U.S. Cl. 244—169 **5 Claims**



1. In a controller for the attitude stabilization of a satellite, having a first attitude control circuit by means of which said satellite can be returned to a position within predetermined band boundaries, $-\phi_B$, $+\phi_B$, and having output signals for controlling positive and negative thrust nozzles, the improvement comprising: a second control circuit, said second control circuit being supplied from said first attitude control circuit with values for the attitude angle ϕ and the angular velocity of the attitude $\dot{\phi}$, said second control circuit including a comparator means for providing an output signal when ϕ, $\dot{\phi}$ have the same sign, two AND elements responsive to the output signal of the comparator, two Schmitt triggers responsive to the positive direction and the negative direction of the attitude error respectively, each for supplying an output signal to one of said AND elements, OR elements responsive to the outputs of said AND elements and also responsive to said output signals from the first control circuit, the outputs of said OR elements being used for activating positive and negative thrust nozzles.

4,174,820

METHOD FOR MOVING A RAILWAY SWITCH AND EQUIPMENT FOR IMPLEMENTING THE METHOD

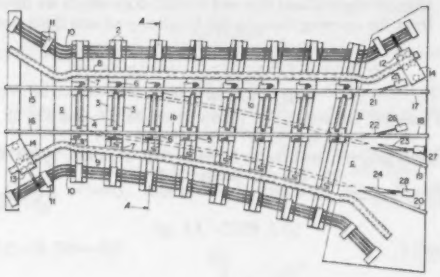
Bernd-Joachim Kempa, Berlin, Fed. Rep. of Germany, assignor to Elektro-Thermit GmbH, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 912,998

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728413

Int. Cl.[2] E01B 7/04

U.S. Cl. 246—430 **11 Claims**



1. In an apparatus for moving a railway switch composed of travel rail sections of a main track which are pivoted to rail sections of a branch-off track and locked by closing elements in a particular position with respect to a switch plate extending across the switch,

the improvement comprising two positioning sled means,

a profiled guide rail means supporting each of said sled means, one of said guide rail means being outside of and parallel to said travel rail sections of said main track, and the other of said guide rail means being outside of and parallel to said rail sections of said branch-off track,

and cross-piece means on each positioning sled means, each of said cross-piece means having compression roller means mounted thereon and adapted to engage the inside of a rail head of an adjacent travel rail.

4,174,821

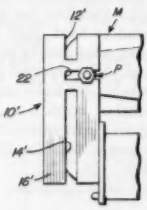
BRACKETS FOR MOUNTING MOTORS

Fred Levine, P.O. Box 380876, Miami, Fla. 33138

Continuation-in-part of Ser. No. 692,271, Jun. 3, 1976, Pat. No. 4,076,196. This application Jan. 5, 1978, Ser. No. 868,267

Int. Cl.[2] H02K 9/00

U.S. Cl. 248—661 **1 Claim**



1. A motor mounting bracket for attachment between preexisting mounting points on a variety of motors and preexisting mounting points on a motor support structure comprising:

a substantially planar, generally rectangular member having first and second spaced ends, with a first slot being formed in said member, said first slot starting at an opening on said first end and extending longitudinally of said member, said first slot having sides which are parallel to said member longitudinal sides, said first slot extending to a position past the longitudinal center of said member;

a second slot extending from an opening in said second end and having sides which are parallel with said member longitudinal sides and longitudinally aligned with the sides of said first slot, said second slot terminating at a position prior to the longitudinal middle of said member and spaced from said first slot; and

a third slot extending from an opening in one of the longitudinal sides of said member and extending transversely of the member between the position of termination of said first slot and a position of termination of said second slot, said third slot terminating at a position aligned with the aligned edges of said first and second slots which are distal from the opening forming the beginning of said third slot.

4,174,822

SHOWER HOLDER

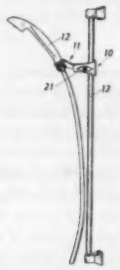
Nils Larsson, Dalävagen 50, Västra Frölunda, Sweden 421 68

Filed Sep. 9, 1977, Ser. No. 831,927

Claims priority, application Sweden, Sep. 17, 1976, 7610371

Int. Cl.[2] B05B *15/06*

U.S. Cl. 248—75 **4 Claims**



1. A shower holder assembly comprising in combination an elongated bar, means for attaching said bar to a wall, a bracket, a holder member for a shower handle attached to said bracket, said bracket comprising a yoke-like member defining an opening receiving said bar, said bracket being slidable along said bar and rotatable about said bar, said bracket including a pair of generally parallel shanks extending from said opening, said holder member being attached between said shanks and being connected thereto by means of a pivot pin, said holder member including a gripping ring for the shower handle said ring being open on one side and an adjustable tightening means connected between said shanks for releasably clamping the bracket to the bar and simultaneously clamping the holder member in position in the bracket by adjusting the distance between the shanks, wherein the holder member has a width which decreases towards a free end at least over the portion of the holder between said shanks, said shanks being spaced apart a distance substantially equal to the thinnest part of said portion at said free end of said holder, whereby said shanks are force apart by said holder member portion such that the holder member remains fixed against unintentional pivotal movement even if said tightening means is loose for sliding adjustment of said bracket along said bar.

4,174,823

MOTOR VEHICLE REAR-VIEW MIRRORS

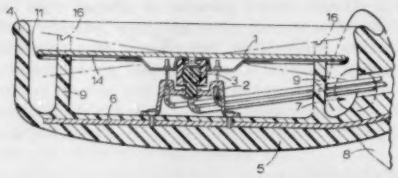
Christopher J. Sutton, Leamington Spa, and Leonard Trigg, Stockton, both of England, assignors to Desmo Limited, Warwickshire, England

Filed Jan. 23, 1978, Ser. No. 871,445

Int. Cl.[2] B60R *1/06*

U.S. Cl. 248—582 **8 Claims**

1. A rear view mirror for a motor vehicle comprising a housing adapted to be secured to the vehicle, a reflective element, an adjustable joint by which the reflective element is mounted in the housing and which enables the reflective element to be adjusted in relation to the housing to alter the rear view, wherein the housing is a moulding of self-skinning foam plastics material and includes resilient projections which are



integrally formed in the foam material of the housing and which bear on the back of the reflective element on opposite sides of the adjustable joint and remote from the adjustable joint.

4,174,824

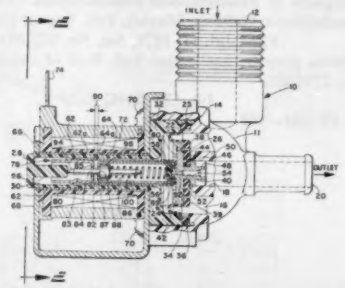
PRESSURE OPERATED PILOT CONTROL SHUT-OFF VALVE

Lawrence A. Kolze, Bensonville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 13, 1977, Ser. No. 796,779

Int. Cl.[2] F16K *31/40*

U.S. Cl. 251—30 **17 Claims**



1. A valve assembly of the type energizable upon connection to a source of electrical power to permit fluid flow through the main passage thereof, said assembly comprising:

(a) housing means defining a fluid passage having an inlet and an outlet and including means defining a main valve seating surface intermediate said inlet and outlet, said housing means including guide means defining a guide hollow having the walls thereof formed of non-magnetic material;

(b) a main valve member movable with respect to said housing means between a closed position contacting said seating surface, and an open position spaced from said seating surface permitting fluid flow from said inlet to said outlet;

(c) means biasing said main valve member to the closed position;

(d) means defining a pilot flow passage through said valve member for communicating said inlet and outlet;

(e) a pilot valve member movable with respect to said main valve member between a closed position preventing fluid flow through said pilot passage and an open position permitting flow through said pilot passage;

(f) electromagnetic means operable upon said energization to move said pilot valve from said closed to said open position including means biasing said pilot valve member to the closed position, said electromagnetic means including,

(i) first pole-piece means comprising a pair of tubular

members formed of ferromagnetic material received in said housing means with the ends thereof axially spaced to define therebetween a predetermined air gap, said tubular members being disposed about said guide means,

(ii) second pole-piece means formed of ferromagnetic material and movably received in said guide hollow,

(iii) armature means formed of ferromagnetic material movably received in said guide hollow and movable between a first position spaced from said second pole-piece means in which first position said pilot valve is closed and a second position contacting said second pole-piece means in which second position said pilot valve is opened,

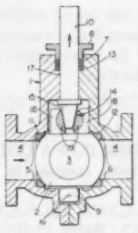
(iv) stop means movable with said second pole-piece means and operable to limit the movement of said armature means relative to said second pole-piece means, wherein, upon energization of said electromagnetic means, said armature means is moved from said first position to said second position such that said pilot valve is opened and flow is permitted through said pilot passage thereby causing a pressure differential across said pressure responsive means and opening of said main valve by said pressure differential acting on said pressure responsive means, wherein as said main valve moves from said closed to said open position, said stop means, second pole piece means and said armature means move as a unit therewith, and wherein, in the deenergized condition, said armature means is disposed such that the space between said armature means and said second pole-piece means is disposed longitudinally at the same station as said air gap.

4,174,825

BALL VALVE WITH RECIPROCAL AND ROTATABLE SPINDLE

Juha A. E. Nelimarkka, Marjalahdentie 8, 00930 Helsinki 93, Finland

Filed Nov. 28, 1977, Ser. No. 855,334
Claims priority, application Finland, Dec. 28, 1976, 763718
Int. Cl.[2] F16K *25/00, 5/06*
U.S. Cl. 251—86 **6 Claims**



1. A ball valve comprising

a body provided with a flow channel;

a generally ball-shaped rigid closing organ;

sealing rings fitted into ring-shaped and transverse grooves in the valve body on both sides of said closing organ;

a pair of spindles associated with said closing organ and provided extending from opposite sides thereof for receipt by said body; and mounting said organ so that the pressure of fluid on said organ tips said organ into sealing engagement against a said sealing ring; and

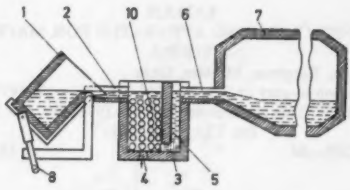
means for actuating said organ to rotate it with respect to said body to effect opening and closing of said flow channel, said means including one of said spindles extending through said body to the exterior of the valve through a sealing mechanism, said one spindle having a wedgelike first end thereof; means defining a generally V-shaped groove in one side of said organ for cooperation with said one spindle first end; and means for mounting said one spindle with respect to said V-shaped groove so that normally said one spindle first end is spaced from operative engagement with said means defining said organ V-shaped groove, and so that low-torque turning of said organ is effected by linear reciprocation of said one spindle into operative association with said means defining said V-shaped groove to move said organ out of tipping engagement with a said sealing ring, and subsequent rotation of said spindle and organ.

4,174,826

APPARATUS FOR LOWERING THE CONCENTRATION OF SODIUM IN ALUMINUM MELTS

Kurt Buxmann; Jean-Daniel Bornand, both of Sierre, and Alfred Steinegger, Venthône, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 780,225, Mar. 22, 1977, Pat. No. 4,138,246.
This application Oct. 13, 1978, Ser. No. 951,214
Claims priority, application Switzerland, Mar. 26, 1976, 3807/76
Int. Cl.[2] C22B *9/02*
U.S. Cl. 266—227 **9 Claims**



1. An apparatus for lowering the sodium concentration of an aluminum melt comprising:

a filter chamber having a floor, an aluminum melt inlet and an aluminum melt outlet;

filter means provided in said chamber between said inlet and said outlet;

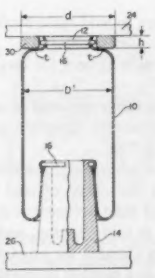
said filter means comprising a loosely packed bed of granular material comprising a carrier material and a chemically active carbon coating provided on the surface of said carrier material.

4,174,827

AIRSPRINGS

Arthur B. Hirtreiter, Akron, and Paul R. Brown, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 4, 1977, Ser. No. 839,488
Int. Cl.[2] F16F *9/04*
U.S. Cl. 267—65 B **8 Claims**



1. A high ratio L/D rolling lobe airspring mounted between

two members capable of relative motion between them comprising:

a piston mounted to one of the members;

a plug mounted to the other of the members;

a flexible sleeve type membrane mounted at one of its ends to the piston and at the opposite end to the plug by means of ring fittings to form an airtight chamber between them, the mounting being such that the piston moves axially into the tubular membrane and the membrane walls form lobes encasing the piston;

means to pressurize the chamber; and

a collar mounted at the end of the membrane having the plug, exteriorly of and axially aligned with the plug such as to limit any upward excursion of the membrane upon being subjected to load forces.

4,174,828

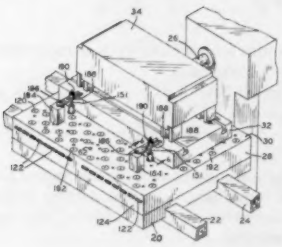
BAYONET CLAMPING APPARATUS FOR MACHINE TOOLS

Raymond A. Bergman, Minster, Ohio

Continuation-in-part of Ser. No. 684,725, May 10, 1976, Pat. No. 4,058,885. This application Aug. 31, 1977, Ser. No. 829,358

Int. Cl.[2] B23Q *7/00*

U.S. Cl. 269—34 **14 Claims**



1. Apparatus for clamping a workpiece or workpiece fixture in a machine tool comprising:

a table having a surface adapted to support a workpiece or workpiece fixture thereon,

a fluid actuator including a piston and cylinder mounted within said table beneath said table surface, one of said piston or cylinder being stationarily secured to said table, and the other of said piston or cylinder being fluid actuated,

a plurality of openings in said table surface through which said fluid actuator is accessible,

a plurality of removable covers for covering selected said openings,

a clamp element removably received in one of said openings for sliding movement in a direction generally normal to said table surface,

means for selectively mechanically interlocking said clamp element with said the other of said piston or cylinder whereby when said fluid actuator is actuated, said clamp element will slide in said opening, and

means on said clamp element for engaging a workpiece or workpiece fixture in a manner to enable clamping of same to said table when said clamp element is drawn toward said table by said fluid actuator.

4,174,829

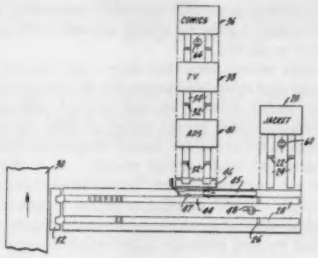
NEWSPAPER STUFFERS

William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Elmer Bewersdorf, Downers Grove, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Feb. 1, 1978, Ser. No. 874,265

Int. Cl.[2] B65H *5/30*

U.S. Cl. 270—55 **5 Claims**



1. In a newspaper stuffing machine where a newspaper section is opened at a stuffing station so it may be stuffed with insert material, the newspaper being fed from a jacket supply hopper to a transport conveyor moving past the stuffing station which is located in front of a gathering conveyor on which is gathered the insert material to be stuffed, and in which the insert material may be composed of a number of individuual inserts fed to the gathering conveyor from a corresponding number of insert supply hoppers disposed in feeding relation to the gathering conveyor:

means to feed the newspaper sections one by one from the jacket supply hopper to the transport conveyor;

a detector to detect failure to feed a newspaper section timely to the stuffing station;

a reject deflector positioned at the stuffing station normally to support and guide the gathered insert material for delivery into the opened newspaper section and when actuated serving to guide the gathered insert material into a discard station;

and means to actuate the reject deflector in the event of failure to detect a timely fed newspaper section thereby to prevent delivery of the insert material intended for the missing newspaper section.

4,174,830

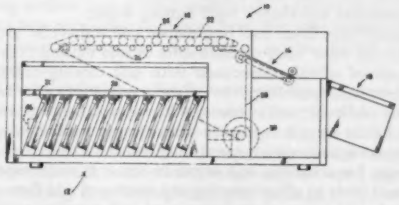
SHEET FEEDER FOR A COLLATOR

Hans C. Mol, Wilton, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Jun. 12, 1978, Ser. No. 914,340

Int. Cl.[2] B65H *39/055*

U.S. Cl. 270—58 **3 Claims**



1. Sheet collating apparatus comprising:

A. a plurality of parallel spaced open ended sheet storage bins for storing stacks of sheets therein;

B. pusher means movably mounted in each of said bins and

normally operatively engaged with the topmost sheet of each of said stacks to push said topmost sheets from said bins;

C. drive means for simultaneously reciprocating said pusher means in each of said bins in a sheet pushing stroke and a retracting stroke;

D. conveyor means disposed adjacent the open ends of said bins for receiving sheets from said pusher means and for conveying said sheets to a discharge station of the collating apparatus, and;

E. means for controlling said normal operative engagement of said pusher means with the topmost sheet of each of said stacks, said means including a magnetic latching plate carried on one portion of said pusher means and a magnet affixed to another portion of said pusher means for disengaging said pusher means from said topmost sheet when said pusher means is adjacent the end of its sheet pushing stroke whereat said magnet pulls in and latches said pusher means to said magnetic latching plate and means for re-engaging said pusher means with the next succeeding topmost sheet when said pusher means is adjacent the end of its retracting stroke whereby said pusher means is out of engagement with said succeeding topmost sheet during the retracting stroke of said pusher means.

4,174,831

DEVICE FOR INSERTING A NEW STACK OF SHEETS IN FEEDING POSITION WITHOUT INTERRUPTION OF SHEET-FEEDING MECHANISM OPERATION

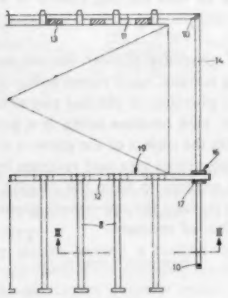
Josef Marass, Seehausen, and Rudolf Liepert, Augsburg, both of Fed. Rep. of Germany, assignors to Georg Spiess GmbH, Gersthofen, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,671

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637086

Int. Cl.[2] B65H *1/26*

U.S. Cl. 271—159 **12 Claims**



1. In a continuously operable sheet-feeding mechanism for a printing press or other discrete sheet processing machine, a device for replenishing a stack of sheets in position for sheet-feeding, without interruption of the progress of sheet-feeding, comprising, in combination:

a stacking table;

a frame for supporting sheet-feeding apparatus above the stacking table;

first hoist means for lifting and lowering the stacking table within said frame;

a set of parallel carrier rods oriented parallel to the direction in which sheets are fed off said stack by the sheet-feeding apparatus supported by said frame, which carrier rods are insertable below the bottom of a stack of sheet material into a set of parallel grooves distributed over the area of the stacking table;

a front cross rod and a rear cross rod perpendicular to the carrier rods, arranged so as to support said carrier rods and extending completely across the set of carrier rods, and

second hoist means for lifting and lowering said cross rods, whereby said carrier rods and a depleted stack thereon may be lifted gradually on said carrier rods as required by said sheet-feeding apparatus while the stacking table is lowered to receive a new stack of sheet material,

said rear cross rod being adjustable in the sheet-feeding direction so that it may abut the rear edge of a stack of sheet material on said stacking table and having a configuration and disposition such as to function as a rear stop for the bottom of a stack that is located above the carrier rods, said carrier rods being insertable in support means affixed to said cross rods at the time they are inserted in said grooves of said table and being withdrawable after a new stack is brought up under them by said first hoist means.

4,174,832

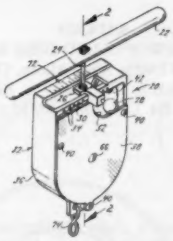
FRICTION TYPE EXERCISE DEVICE

Charles W. Thompson, R.R. 2, Box 24A, Columbia, Ill. 62336

Filed Nov. 8, 1976, Ser. No. 739,627

Int. Cl.[2] A63B *21/00*

U.S. Cl. 272—133 **10 Claims**



2. An exercise device having means mounting a cord within the device for selective movement of the cord into and out of the device, the device having further means to resist movement of the cord as the cord moves out of the device, said last mentioned means including spool means about which the cord may be wound and lever means supported in the device and cooperating with the spool means for pivotal movement thereof so as to force the cord on the spool means against the device.

4,174,833

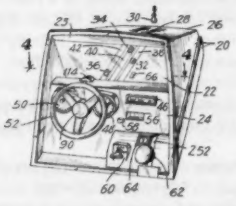
SIMULATED ROAD RACING GAME

Michael Hennig, Fort Lee, N.J., and Lawrence Reiner, Woodbury, N.Y., assignors to Mego Corp., New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,517

Int. Cl.[2] A63F *9/14*

U.S. Cl. 273—1 E **42 Claims**



1. A simulated road racing game comprising an enclosure, means to provide light in said enclosure, a transparent panel, said transparent panel being both light transmissive and light reflective, said transparent panel being an inclined front part of said enclosure, at least one movable belt within said enclosure,

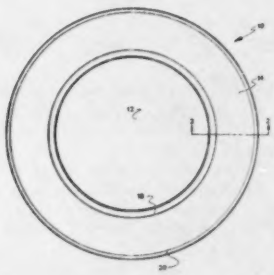
said belt having a substantially horizontal reach, means within said enclosure to move said belt along said reach, at least one toy vehicle mounted on said belt, so that said one toy vehicle is visible through said inclined transparent panael, at least one other toy vehicle within and adjacent the front of said enclosure, said other toy vehicle being disposed in front of said inclined transparent panel so that the image of said other toy vehicle is reflected from said inclined transparent panel in juxtaposition with said one toy vehicle, means to manipulate said other toy vehicle so that the image of said other toy vehicle can be moved relative to said one toy vehicle, sensor means for sensing the instance of visual coincidence of said one toy vehicle with the image of said other toy vehicle, and means for imparting motion to said other toy vehicle such that said other toy vehicle appears to perform a somersault over said one toy vehicle in response to the sensing of said instance.

4,174,834

STICK-PROPELLED DISK GAME

Aldo De Martino, 26 Dodge Ave., Akron, Ohio 44302

Filed Oct. 3, 1977, Ser. No. 838,465
Int. Cl.[2] A63B *65/10*
U.S. Cl. 273—96 B **3 Claims**



1. A stick-propelled disk game, comprising:

an annular disk having an opening centrally located within said disk, said disk having an inner circumferential edge about said opening having rounded edges for maintaining laminar flow of air over said disk during flight;

an outer circumferential edge about the outside circumference of said disk having rounded edges;

said circumferential edges being of a thickness greater than the thickness of the portion of said disk therebetween, such difference in thicknesses defining an aerodynamic cup between said circumferential edges;

said circumferential edges extending equidistance above and below the portion of said disk therebetween and thereby defining aerodynamic cups on upper and lower surfaces of said disk;

wherein said inner circumferential edge is of a width approximately equal to fifteen percent of the overall width of said disk between said opening and said outer circumferential edge of said disk, and wherein said outer circumferential edge is of a width approximately equal to one-half of the width of said inner circumferential edge; and

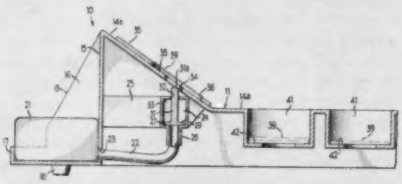
at least one stick for engagement with said opening for propelling and retrieving said disk.

4,174,835

COMPETITIVE GAME

Jeffrey D. Breslow, Highland Park; Michael J. Ferris; Henry Arias, both of Chicago, and Walter J. Wozniak, Addison, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 29, 1977, Ser. No. 865,735
Int. Cl.[2] A63B *71/04;* **A63F** *9/02*
U.S. Cl. 273—101 **4 Claims**



1. A game apparatus, comprising:

a plurality of sets of generally disc-shaped playing pieces, one set for each player of the game, each playing piece having indicia thereon distinguishing one set thereof from another set;

means defining a central, generally flat horizontal playing surface interconnecting the launching stations;

a plurality of opposed playing piece launching stations, each launching station including manually operable pneumatic playing piece propulsion means for launching a playing piece toward an opposing launching station, said playing piece propulsion means including a manually compressible air bulb, a cylinder communicating with said air bulb and mounted in a vertical position relative to the playing surface, and a plunger movably positioned in and guided by said cylinder to propel a playing piece in an end over end trajectory in response to compression of said air bulb;

means defining a launching retainer for receiving and supporting one of said playing pieces in a canted position relative to said playing surface for launching thereacross; and

a plurality of generally tubular shaped recesses formed in said playing surface, each recess being of sufficient depth to receive a plurality of playing pieces stacked on top of one another, said recesses being in a predetermined pattern whereby the object of the game is to launch a plurality of playing pieces into said recesses by a player of the game in an attempt to have the playing pieces of his respective set occupy the uppermost position in a predetermined number of recesses.

4,174,836

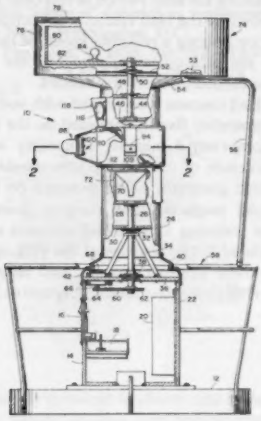
GAME FOR SIMULATING SUBMARINE CONNING STATION

Phillip C. Kearney, Aptos, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Nov. 17, 1977, Ser. No. 852,434
Int. Cl.[2] A63F *9/02*
U.S. Cl. 273—101.2 **11 Claims**

1. A game for simulating the visual, audio and physical conditions at the conning station of a submarine, including the combination of a pedestal, a simulated periscope column mounted on the pedestal for rotation about a vertical axis, a periscope eyepiece carried on a side of the column for viewing along a line of sight, video means mounted within the column for forming a video display which simulates a scene viewed through the periscope of a submarine, means for directing the video display along the line of sight of the eyepiece, enclosure means having spaced-apart transparent walls extending across said line of sight and disposed between the eyepiece and video

means, a liquid carried within the enclosure means at a level for creating an image which simulates the water line above a



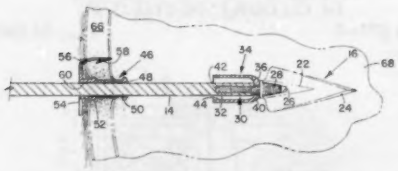
submarine, and speaker means for simulating sounds at the conning station of a submarine.

4,174,837

DRUG DISPENSING APPARATUS FOR A HUNTING ARROW

Gus A. Benke, Rte. 9, Box 850, San Antonio, Tex. 78227

Filed Mar. 16, 1978, Ser. No. 887,187
Int. Cl.[2] F41B *5/02*
U.S. Cl. 273—106.5 R **7 Claims**



1. A drug dispensing apparatus for use in hunting animals with a bow and arrow, said arrow having an arrowhead releasably secured to a forward end of a shank, said drug dispensing apparatus comprising:

center cylinder means having a central opening along a longitudinal axis thereof for slideably receiving said shank therethrough, said center cylinder means having at least one outwardly extending flange along a trailing end thereof;

outer cylinder means with means for securing on a forward end thereof to said arrow at said arrowhead, a rear end of said outer cylinder means slideably receiving and sealing with said center cylinder means to define a space therebetween, said space having a drug therein for immobilizing said animal upon impact.

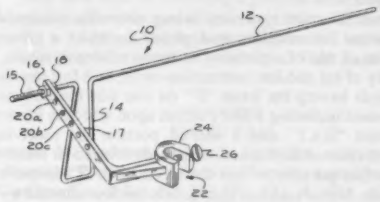
4,174,838

GOLF PUTTER ALIGNING DEVICE

Paul E. Paschetto, 136 Melwood Ave., East Longmeadow, Mass. 01028

Filed Jun. 30, 1978, Ser. No. 920,814
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—163 A **5 Claims**

1. In combination with a golf putter having a shaft with a head at its lower end, a horizontal pointer for aligning the head with respect to a ball, pendulum means mounted for free swinging, pivoted movement with respect to the pointer for aiding in positioning a golfer's head in a vertical direction with



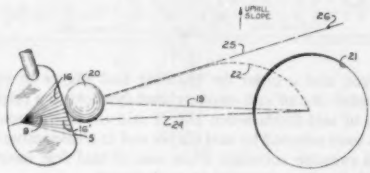
respect to the ball and clamping means removably securing the pendulum means and pointer to the shaft over the head.

4,174,839

GOLF CLUB INCLUDING PUTTING GREEN SLOPE CORRECTION AIMING LINES

Duane K. Marrs, 806 2nd Ave., Monett, Mo. 65708

Filed Mar. 21, 1978, Ser. No. 888,766
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—183 D **5 Claims**



1. A golf club including a shaft, a mallet type club head affixed to said shaft and having a ball striking surface, said head including a top surface intersecting with said striking surface, and having a ball aiming arrangement comprising:

(a) a thin, elongate visible center line on said head top surface and extending substantially perpendicularly to the intersection of said top surface and said striking surface for establishing a ball striking path for squarely hitting the ball;

(b) a focal area on said head top surface, said focal area being aligned with said center line and spaced from said striking surface;

(c) a plurality of visible straight indicating lines on said top surface and emanating from the direction of said focal area, said indicating lines forming a congruent array of multiple pairs of indicating lines on said top surface and extending in opposed angular directions from said center line to said intersection for establishing a series of selective aiming paths directly from the club to a target angularly deviating from the ball striking path; and

(d) coded indicia on said top surface identifying respective indicating lines.

4,174,840

WEIGHT CONTROL GAME APPARATUS

Richard A. Curtiss, 207 Carlton Club Dr., Piscataway, N.J. 08854

Filed Feb. 24, 1978, Ser. No. 880,976
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—248 **12 Claims**

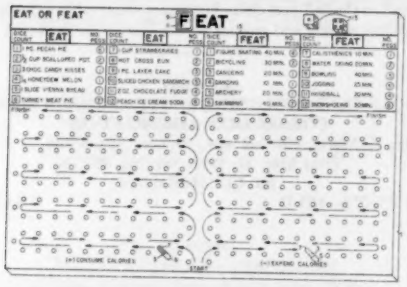
1. A weight control game apparatus comprising:

a gameboard having a plurality of consecutive playing positions;

chance selection means for enabling a player to make a chance selection of one of a variety of foods and exercise

activities, each of said foods and exercise activities having a respective number of moves between said playing positions related at least approximately to the caloric value associated with it;

said chance selection means including normally manipulatable means for enabling said player to make a chance selection of one of a plurality of move related symbols, a plurality of eat and feat instruction cards, said feat instruction cards having the letter "F" on one side thereof, said gameboard including a first portion upon which is formed the word "EAT" and a second portion for receiving selected ones of said instruction cards located in relation to said first portion so that the word "FEAT" is spelled out when one of said feat instruction cards is selected by a



player; and a chart for enabling said player to relate a selected one of said move related symbols to a respective one of said foods when one of said eat instruction cards has been selected by said player and to a respective one of said exercise activities when one of said feat instruction cards has been selected by said player;

a first playing position marker for indicating movement between said playing positions corresponding to consumption of selected ones of said foods; and

a second playing position marker for indicating movement between said playing positions corresponding to the performance of selected ones of said exercise activities;

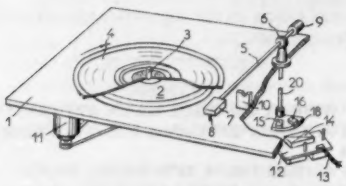
the relative positions of said first and second playing position markers determining one of weight loss and weight gain and the respective amount thereof.

4,174,841

RECORD PLAYER WITH START-STOP CONTROL BY MEANS OF A MAGNETIC FIELD

Alain Cousin, Flers, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,602
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—1 L **10 Claims**



1. A record player comprising a chassis; a turntable, a pivotable pick-up arm assembly having a cartridge and pick-up sytlus mounted thereon, a fixed arm support, and an electric motor for driving the turntable, mounted on the chassis; means for supplying power to the motor, including control means comprising a motor-stop switch, a first magnetic field generator associated with a Hall-effect detector element movable relative to each other in conjunction with the pivoting movement of the pick-up arm to generate an output stop signal, and a circuit for actuating the stop switch in response to the output stop signal supplied by the Hall element, said circuit including a differentiator for sensing a pivoting speed of the arm which corresponds to the pick-up stylus scanning the zone which follows after the recording area of a record,

wherein said Hall element is combined with said circuit as an integrated assembly fixedly mounted on the chassis, and

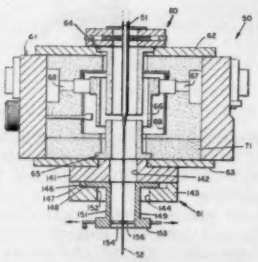
the player comprises a member adjustably secured to a pivoting structure of the pick-up arm assembly, said first magnetic field generator being mounted on the member; and a second magnetic field element mounted on the member for inducing in said Hall element a start signal which is related to the position of the pick-up arm which has been moved from its support, said circuit including means for energizing the motor responsive to said start signal.

4,174,842

NON-CONTACTING SEAL FOR TREATING CHAMBER THROUGH WHICH ELONGATED MATERIAL IS MOVED

Fred P. Partus, Atlanta, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,223
Int. Cl.[2] C03B *37/00;* **F16J** *15/40*
U.S. Cl. 277—3 **11 Claims**



1. Apparatus for sealing a treating chamber into which an elongated material extends, which comprises:

a disc-shaped member adjacent an entrance to the treating chamber and having an opening through which the elongated material extends into the treating chamber without contacting the disc-shaped member when said opening is substantially centered about the elongated material;

means for supporting the disc-shaped member for movement in a plane substantially perpendicular to the elongated material; and

means for flowing a gas through the disc-shaped member into the opening and into engagement with the elongated material at an angle such that the disc-shaped member is moved in the plane relative to the elongated material to center its opening about the elongated material, and such that the gas is divided into streams that move along the elongated material in opposite directions to seal the treating chamber.

4,174,843

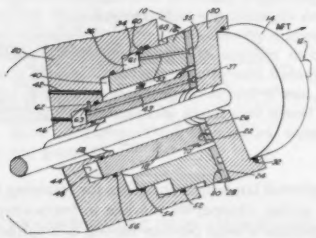
SELF-ADJUSTING TANDEM SEAL

John P. Arena, Middletown, R.I.; Charles G. McGuigan, Arlington, Va., and Gene A. Rossi, North Providence, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1978, Ser. No. 913,935

Int. Cl.[2] F16J *15/40, 15/34*

U.S. Cl. 277—3 **10 Claims**



1. An adjustable dynamic feedback seal system comprising:
a seal ring having at least one feedthrough aperture for providing feedback pressure to said seal ring;
a mating ring adapted for abutting with said seal ring and having a common axis with said seal ring, said mating ring adapted to be rotated with respect to said seal ring; and
a chamber located at an end of said seal ring away from said mating ring and venting an end of said at least one feedthrough aperture, said chamber being otherwise sealed.

4,174,844

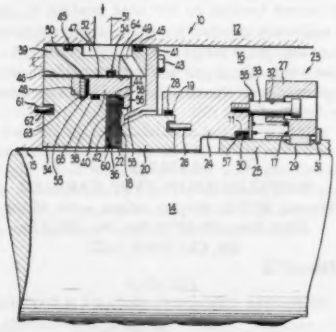
MECHANICAL SEAL

Arthur Zobens, Mount Prospect, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed Dec. 5, 1975, Ser. No. 637,975

Int. Cl.[2] F16J *15/38*

U.S. Cl. 277—85 **8 Claims**



1. In a face type rotary mechanical seal having a pair of sealing members in relatively rotating sealing engagement, a sealing member comprising:
(a) a generally annular sealing ring formed of carbon material defining a sealing face for a relatively rotating sealing engagement with the other sealing member, said carbon sealing ring having an outer peripheral surface and at least one generally radially directed annular support surface spaced from said sealing face;
(b) a generally annular rigid back-up ring having a generally radially directed annular support surface in supporting contact with said support surface of said sealing ring; and
(c) means defining a pressure barrier overlying the outer peripheral surface of said carbon sealing ring to separate said outer peripheral surface from the fluid to be sealed; and
(d) wherein said barrier defining means comprises a rigid generally annular retainer secured to said rigid back-up ring, said retainer including a portion overlying said outer peripheral surface of said sealing ring, and means providing a fluid tight seal between said retainer and said carbon seal ring to prevent entry of sealed fluid therebetween.

4,174,845

FLUID SEAL

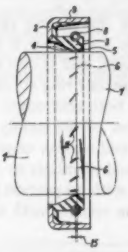
Bernard M. Hadaway, Highett, Australia, assignor to Repco Research Proprietary Limited, Victoria, Australia

Continuation of Ser. No. 601,651, Aug. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 349,174, Apr. 9, 1973, Pat. No. 3,923,315. This application Jun. 30, 1977, Ser. No. 811,857

Claims priority, application Australia, Aug. 15, 1974, PB8545/74

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—134 **11 Claims**



1. A fluid seal for use between two relatively rotatable members including:
an annular body attachable to one of said members;
a circumferential resilient, flexible lip formed on said body and projecting therefrom so that a sealing edge of said lip is engageable with the other said member;
said sealing edge being defined by the common edge of two angularly disposed annular surfaces;
a pumping configuration formed on one of said surfaces and being operative to urge fluid towards said sealing edge during relative rotation of said members; and
a plurality of discontinuities in the form of ribs on said same surface as said pumping configuration, projecting out from said surface, and extending over said sealing edge to said other angularly disposed annular surface,
said ribs being at regularly spaced intervals around the circumference of said lip edge; and
said ribs and said lip being resiliently deformable whereby as said sealing edge engages said other member, capillary recesses form on either side of said rib to permit fluid to be transferred from one side of said lip to the other under dynamic conditions, but not under static conditions.

4,174,846

SEALING RING

Lynn S. Scott, Salt Lake City, Utah, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

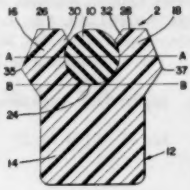
Continuation of Ser. No. 777,799, Mar. 15, 1977, abandoned, which is a division of Ser. No. 631,856, Nov. 14, 1975, Pat. No. 4,013,299. This application Mar. 9, 1978, Ser. No. 884,868

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—205 **4 Claims**

1. A sealing ring for installation between two members spaced apart a predetermined distance, said sealing ring comprising a U cup and an elastomeric expander ring, said U cup having an annular base of generally rectangular cross section

and spaced lips extending from one side of the base to form a cavity between the lips into which cavity the expander ring is mounted, each lip having a free end remote from the base, said expander ring when in the cavity having an initial maximum cross section dimension located substantially at the midpoint of the ring in the direction that said lips extend from the base, said expander ring when in the cavity being substantially symmetrical in cross section about a plane through said midpoint and normal to said direction, said lips each having a pair of frustoconical surfaces that intersect to form well defined circular



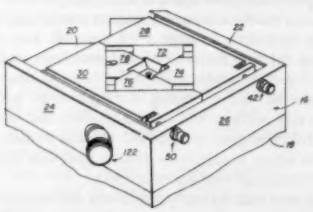
sealing edges that when the sealing ring is uninstalled are transversely spaced from each other a distance greater than said predetermined distance, said U cup when the sealing ring is uninstalled and the expander ring is bottomed in said cavity having a plane through both said edges that is between said midpoint and the bottom of the cavity whereby when the sealing ring is installed said sealing edges move toward each other by contact with said members to cause said lips to deform said expander ring with no portion of the lips other than the sealing edges being in contact with said members.

4,174,847

PRECISION CENTERING DEVICE

Mordechai Wiesler, Lexington, Mass., assignor to Teledyne, Inc., Hawthorne, Calif.

Filed Dec. 12, 1977, Ser. No. 859,734
Int. Cl.[2] B23B *31/16*
U.S. Cl. 279—1 L **12 Claims**



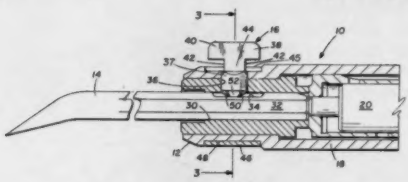
1. A precision positioning device comprising:
(a) a base;
(b) two plates mounted on said base, said plates mounted for relative movement in side-by-side relationship on said base, an opening defining a guideway formed in said plates, said opening formed between said plates, the profile of said opening governed by the relative position on said plates;
(c) a plurality of relatively movable guides constrained by said guideway for mutual coacting movement, a port of predetermined geometrical configuration formed by said guides; and
(d) position means connected to at least one of said guides for moving each of said guides, said geometrical configuration of said port governed by the profile of said opening, the size of said port determined by the relative positions of said guides.

4,174,848

LATCHING MECHANISM FOR RECIPROCATING IMPACT TOOLS

Victor E. Richardson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 1, 1978, Ser. No. 882,474
Int. Cl.[2] B25D *17/08*
U.S. Cl. 279—19.5 **3 Claims**



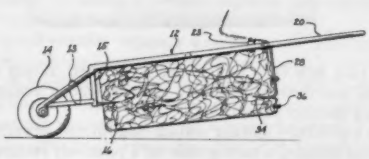
1. An improved latching mechanism for retaining a bit, such as a chisel, scaler, chipper or the like in impact-type, power tools that include a nose portion having a longitudinally extending opening sized to slidably receive the shank of the bit wherein the shank of the bit has a longitudinally extending latch recess along an intermediate part of one side and the nose portion also has a radial port intersecting the opening, the improvement comprising:
a latch member extending through the radial port and rotatable therein between latched and unlatched positions, said latch member having a gripping portion on a first end disposed outside the nose and a bit engaging portion on a second end disposed inside the opening in the nose portion, said bit engaging portion having first surface means engageable with the bit when said latch member is in the latched position for preventing removal of the bit from the nose while permitting limited reciprocating movement of the bit and second surface means frictionally engaging the bit when said latch member is in the unlatched position for inhibiting the inadvertent discharge of the bit from the opening while permitting intentional insertion and removal of the bit; and
resilient means located on the nose portion in engagement with said latch member for preventing inadvertent movement of said latch member from one position to the other and for resiliently urging said latch member into frictional engagement with the bit when said latch member is in the unlatched position.

4,174,849

WHEELBARROW TYPE CARRIER

Alvin L. Wetzel, 1025 S. Stapley, Mesa, Ariz. 85204

Filed Nov. 23, 1977, Ser. No. 854,151
Int. Cl.[2] B62B *1/22*
U.S. Cl. 280—47.3 **4 Claims**



1. A carrier for transporting a bale of compacted resilient material, which item is penetrably accessible to prong means, said carrier comprising in combination:
(a) a framework having a forward end and a rear end;
(b) intermediate frame member means disposed between the forward end and the rear end for stabilizing the bale against rotation along a fore and aft axis of said framework by juxtapositioning of said bale with said intermediate

frame member means upon engagement of said carrier with the bale;

(c) a wheel rotatably attached to the forward end of said framework for supporting the forward end of said framework during transport of said carrier across the ground;

(d) prong means extending rearwardly from the forward end of said framework for penetrably supportingly engaging the material of the bale through the face of one end of the bale;

(e) a pivotable prong means pivotally depending from said framework for penetrably and supportingly engaging the face of another end of the bale, whereby said prong means and said pivotable prong means support in concert the bale in a depending relationship to said framework; and

(f) handle means disposed at the rear end of said framework for pivoting said framework about said wheel and applying a force to transport the framework supported bale across the ground.

4,174,850

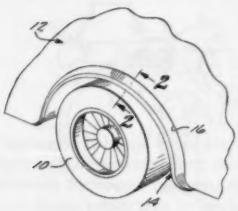
FENDER FLARE CLIP APPARATUS

Richard K. Hart, 11422 Yearling Clr., Cerritos, Calif. 90701

Filed May 30, 1978, Ser. No. 910,473

Int. Cl.[2] B62D *25/16*

U.S. Cl. 280—153 R **4 Claims**



1. In combination with a flare having a lip that underlies a peripheral flange of a vehicle fender, and a vertically extending web that overlies the exterior surface of said fender adjacent said peripheral flange,

a flexible clip of generally truncated triangle shape having a center leg that abuts the exterior of the lip of said flare, the opposite ends of said center leg integrally merging into inner and outer legs which extend away from the ends of said center leg and taper towards one another,

a tooth formed adjacent the free end of said outer leg, and

a bolt threadedly carried by said inner leg so as to be rotated into tight frictional engagement with the inside of said fender adjacent the lip thereof to thereby releasably lock said clip and flare onto said fender, with said tooth in biting engagement with the web of said flare.

4,174,851

BICYCLE FRAME SUPPORT MEMBER

Roger H. Huret, 60, avenue Felix Faure, Nanterre (Hauts-de-Seine), France

Filed Nov. 17, 1977, Ser. No. 852,358

Claims priority, application France, Nov. 17, 1976, 76 34639

Int. Cl.[2] B62K *19/30*

U.S. Cl. 280—288 **10 Claims**

1. A one-piece support member for a bicycle, the bicycle including a frame, a derailleur, a wheel having an axle, and a cable for actuating the derailleur, said one-piece support member comprising:

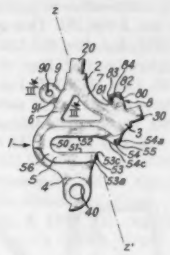
an upper end adapted to be connected to the frame of the bicycle;

a lower end adapted to support the body of the derailleur;

first and second sides extending between said upper and lower ends;

an elongated notch defined in said first and second sides, said elongated notch being adapted to receive the axle of the wheel arranged to oppose said first side of said support member; and

a lug having a front part and a rear part integrally disposed on said support member above said elongated notch, said lug projecting outwardly with respect to the plane of said



support member on said second side, and having an orifice through which the cable for actuating the derailleur is adapted to pass, said orifice having a reduced diameter at said front part, slightly larger than the diameter of the cable, and a larger diameter at said rear part to receive a sheath for protecting the derailleur actuating cable.

4,174,852

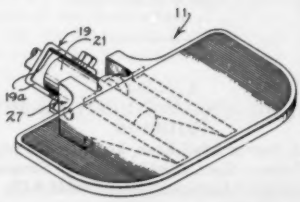
FOOT REST ASSEMBLY FOR MOTORCYCLE

Nace J. Panzica, 3033 Vistamont, San Jose, Calif. 95118, and Tyrone A. Cruze, 6761 San Anselmo, San Jose, Calif. 95119

Filed Jun. 28, 1978, Ser. No. 919,844

Int. Cl.[2] B62J *25/00*

U.S. Cl. 280—291 **5 Claims**



1. A foot rest assembly for a motorcycle comprising a bracket adapted to be mounted to a motorcycle, said bracket having a pair of spaced side walls and a back wall extending along and between said side walls, an extension rod disposed between said side walls, means coupling said rod to said bracket, a foot rest member having a relatively broad elongate foot rest surface, and means coupling said member to said rod at a position beyond said bracket in a manner to support said foot rest member upon said rod.

4,174,853

SKI BRAKE WITH BRAKE ELEMENTS ADAPTED TO FORM A TREAD BODY ENGAGEABLE BY A SKI BOOT AND WITH INWARDLY BENT SPRING WIRE

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

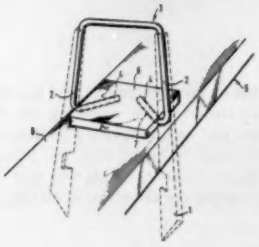
Continuation of Ser. No. 665,789, Mar. 10, 1976, Pat. No. 4,078,825, which is a continuation-in-part of Ser. No. 557,476, Mar. 12, 1975, Pat. No. 3,989,271. This application Mar. 10, 1978, Ser. No. 885,181

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1974, 2412623; Jul. 26, 1974, 2436155; Feb. 20, 1975, 2507371

The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.

Int. Cl.[2] A63C 7/10

U.S. Cl. 280—605 5 Claims



1. A ski brake for automatically braking the free flight of a ski upon the release of a ski boot therefrom, said ski brake comprising:

a mounting plate fixed to an upper surface of the ski and forming a pivot;

a spring wire swingable in said pivot on said plate and having a bight lying in one plane and a shank lying generally in said one plane and having an angularly bent portion received in said pivot and projecting out of said plane at least in an upwardly swung position of said bight so that, upon displacement of said bight toward said surface of said ski, said spring wire is resiliently loaded by distortion against said plate through engagement of said bent portion on said plate at said pivot and said wire springs up on release of said brake by said ski boot into said upwardly swung position; and

at least one brake element operatively connected to said spring wire and displaceable thereby into an operative position in which said element extends downwardly from the ski surface beneath said ski to engage the snow in said upwardly swung position of said bight.

4,174,854

BUILDING AND CONSTRUCTIONAL MACHINES OR VEHICLES

Roland Spicka, Serrig; Adolf Krob, Konz; Detlev Seidel, Konz, and Paul Viefhaus, Konz, all of Fed. Rep. of Germany, assignors to Zettelmeyer Maschinenfabrick GmbH & Co. KG Konz, Fed. Rep. of Germany

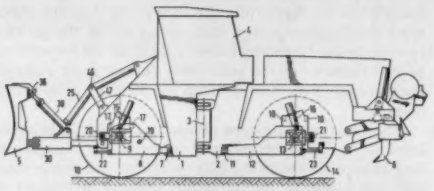
Filed Mar. 6, 1978, Ser. No. 883,680

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710239

Int. Cl.[2] B62D 61/12

U.S. Cl. 280—702 9 Claims

1. A construction vehicle, comprising running gear means, wheel axles mounted on said gear means and wheels mounted on said axles, a resilient suspension system on said running gear means for cushioning the vehicle during transport, means for pressurizing and depressurizing said system for respectively resiliently cushioning said running gear during vehicle transport and for rigidifying said running gear during a working



operation, and means for locking at least one of said axles against cushioning during said working operation.

4,174,855

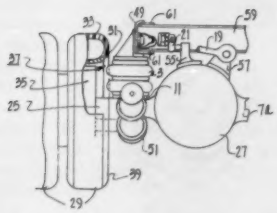
WHEELED VEHICLE AXLE SUSPENSION SYSTEM

Ervin K. Vandenberg, Massillon, Ohio, assignor to Turner Quick-Lift Corporation, Canton, Ohio

Continuation-in-part of Ser. No. 759,217, Jan. 13, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 924,103

Int. Cl.[2] B60G 9/04

U.S. Cl. 280—711 21 Claims



1. In an axle suspension system for a longitudinally frame membered truck, the system comprising a drive axle having located intermediate its ends a drive axle housing of substantially larger cross-sectional dimension than the ends of said axle and having located at each of its ends a wheel comprising a tire radially extending from a transverse rim and hub of lesser transverse dimension than said tire and rim thereby defining a hub cavity between the axle and the tire and rim, a resilient bellows means, means for locating the bellows in load-bearing relationship to the axle and control arm means for connecting the axle to the frame of the vehicle, the improvement comprising means for connecting one end of the resilient bellows means to a longitudinal frame member of the truck and the other end to and substantially directly above the axle, one side of said bellows being thus located adjacent the enlarged housing of the axle and the opposite side extending into said hub cavity, said resilient bellows means comprising an inflatable and deflatable air bag which expands and contracts dimensionally in the vertical and horizontal direction during operation of the truck axle.

4,174,856

CHROMENOINDOLE COLOR FORMERS

Heinz Balli, Riehen; Sigmund Gunzenhauser, Arlesheim, and Jean C. Petitpierre, Kaiseraugst, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 799,063, May 20, 1977, Pat. No. 4,123,439. This application Aug. 21, 1978, Ser. No. 935,393

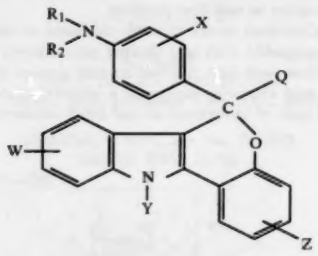
Claims priority, application Switzerland, Jun. 4, 1976, 7115/76

Int. Cl.[2] B41M 5/22

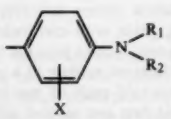
U.S. Cl. 282—27.5 14 Claims

1. A pressure-sensitive or heat-sensitive recording material which contains a colour former system comprising, as the

colour-forming agent, at least one chromenoindole compound of the formula



wherein R_1 and R_2 independently of one another represent lower alkyl, phenyl or benzyl, and R_1 also represents hydrogen, or R_1 and R_2, together with the nitrogen atom which links them, represent pyrrolidino, piperidino or morpholino, X represents hydrogen, halogen, methyl or lower alkoxy, Q represents hydrogen, lower alkyl, phenyl, benzyl or the group of the formula



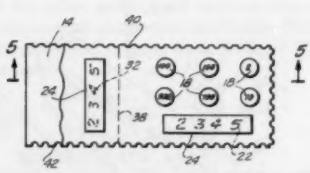
W represents hydrogen, halogen, lower alkyl, lower alkoxy or phenoxy, Y represents hydrogen, lower alkyl, phenyl or benzyl and Z represents hydrogen, halogen, lower alkyl, lower alkoxy, amino or amino substituted by lower alkyl, benzyl or phenyl.

4,174,857

GAME TICKET

John R. Koza, Atlanta, Ga., assignor to Canadian Tag & Label Ltd., Sparta, Mich.

Filed Dec. 28, 1977, Ser. No. 865,202
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—6 **28 Claims**



1. A game ticket having concealed information thereon, said ticket comprising:

a base sheet having the information to be concealed on one side thereof, and a cover sheet overlying the information and affixed to the base sheet;

said cover sheet including an optical barrier sheet secured thereto about the entire periphery of the cover sheet and being joined to the base sheet along the entire peripheral area of the sheets;

said base sheet also including a separate optical barrier sheet secured thereto about the entire periphery of the base sheet;

the information to be concealed being positioned within the area defined by the joined peripheral portions of the base and cover sheets whereby it is optically concealed by the optical barrier sheets in both the base and cover sheets;

an opaque removable material on the base sheet overlying and obscuring the information whereby it is concealed upon removal of the cover sheet from the base sheet;

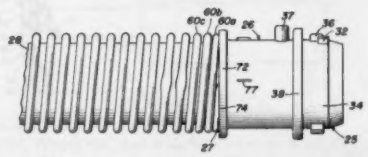
a tear line of perforations in the cover and base sheets extending between at least a portion of the peripheral area of the sheets and the area of the base sheet containing the information whereby the cover and base sheets are adapted to be torn along the tear line to obtain access to the concealed information.

4,174,858

CONNECTION FOR SECURING A HELICALLY CONVOLUTED HOSE TO A HOSE FITTING

Joseph F. Brooks, Bloomington, Ill., assignor to National Union Electric Corporation, Greenwich, Conn.

Filed Dec. 6, 1976, Ser. No. 747,549
Int. Cl.[2] F16L *33/00*
U.S. Cl. 285—7 **13 Claims**



1. A connection for securing one end of a helically convoluted resilient hose to a hose fitting, each of the convolutions of said hose having inner surfaces defined by a pair of axially spaced, substantially radially extending side walls and a connecting end wall, and said fitting including a tubular portion extending into one end of said hose, said connection comprising at least a portion of one thread on the exterior of said tubular portion and having a pitch substantially the same as the pitch of the unstressed convolutions of said hose, said thread portion having substantially radially extending side walls and a substantially flat top so as to define a sharp edge at the intersection of each side wall with said top, said sharp edges frictionally engaging the inner surfaces of at least a portion of one of the convolutions of said hose, said thread portion also having spaced leading and trailing ends with respect to the relative direction of rotation of said tubular portion and said one end of said hose as these parts are being engaged, and barb means carried at the trailing end of said thread portion, said barb means comprising a sharp edge on the trailing end of said thread portion, said sharp edge extending transversely to said thread portion and being wider than said thread portion, the transverse width of said sharp edge also being greater than the internal width of the convolutions of said hose so that said sharp edge digs into the interior of at least one of the convolutions of said hose, whereby relative rotation between said one end of said hose and said tubular portion in a direction to effect disengagement of these parts is resisted when said thread portion is engaged with said portion of said convolution.

4,174,859

CONDUIT COUPLING ASSEMBLY

Joseph Houghton, 6135 DeGuise, Rochester, Mich. 48063

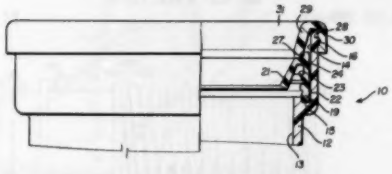
Filed May 24, 1978, Ser. No. 909,096
Int. Cl.[2] F16J *15/10;* **F16L** *17/02, 17/06*
U.S. Cl. 285—111 **4 Claims**

1. In a conduit coupling assembly which couples a conduit that is inserted into said coupling assembly, said coupling assembly comprising:

(a) an annular hub having a first annular interior wall of a diameter slightly greater than the diameter of an inserted conduit and a second annular interior wall concentric with said first interior wall and having a diameter greater

than the diameter of said first interior wall, a portion of said hub connecting said first and second annular walls defining an interior groove portion and a circumferential rib portion extending around the exterior of the hub adjacent a conduit-receiving open end of said hub;

(b) a resilient seal mounted in said interior groove portion of said hub, said resilient seal having a truncated conical sleeve portion and an annular ring portion, said conical sleeve portion joined to said ring portion at one end and said sleeve portion extending progressively, axially away from said one end of said hub and radially inwardly toward the axis of said hub to a second free end, said one end of said conical sleeve portion being thinner than said second free end of said sleeve portion, said second end of said sleeve portion having an internal diameter slightly less than the external diameter of said conduit inserted into the coupling assembly, first raised circumferential rib portions extending around an outer periphery of said ring



portion between said ring portion and said second annular interior wall of said hub, second rib portions extending around an inner circumference of said ring portion between said ring portion and said conical sleeve portion; and

(c) a retainer ring adapted to be mounted on said open end of said hub, said retainer ring having an exterior hub engaging portion and an interior seal engaging portion, a radially inwardly opening circumferential groove in said hub engaging portion mating with said rib portion on said hub to retain said ring in place on said hub, said seal engaging portion engaging and holding said one annular end of said seal ring portion, said conduit being inserted into said coupling assembly and said conical sleeve portion yielding radially outwardly to compress said second rib portions, compression of said second rib portions reacting to cause compression of said sleeve portion against said conduit and compression of said first rib portions against said second annular interior wall of said hub.

4,174,860

OVEN LATCH ASSEMBLY WITH ADJUSTABLE UNLOCKING TEMPERATURE SUB-ASSEMBLY

Christopher J. Shea, New Britain, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sep. 14, 1977, Ser. No. 833,304
Int. Cl.[2] E05C *5/02*
U.S. Cl. 292—113 **9 Claims**

1. A latch for ovens and the like comprising:

A. a support;

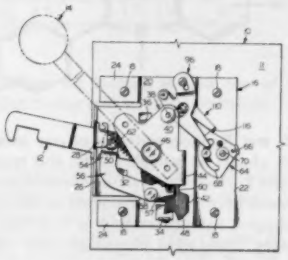
B. a latch subassembly movable on said support between latching and unlatching positions;

C. a high temperature locking pawl having an abutment surface thereon engagable with said latch subassembly to block its movement from latching to unlatching position;

D. means movably mounting said locking pawl on said support;

E. a thermal element operatively connected to said locking pawl and responsive to elevated temperatures to move said pawl from a first position wherein said abutment surface is removed from the path of movement of said latch subassembly from latching position to unlatching position to a second position wherein said abutment surface is disposed in said path of movement of said latch subassembly to block its movement into unlatching position, said thermal element being responsive to subsequent decline in temperature to move said pawl from said second position to said first position;

F. first adjustment means movably mounted on said support and engageable with said locking pawl during its movement from said first position to said second position to locate said abutment surface in a predetermined position in said path of movement of said latch subassembly; and



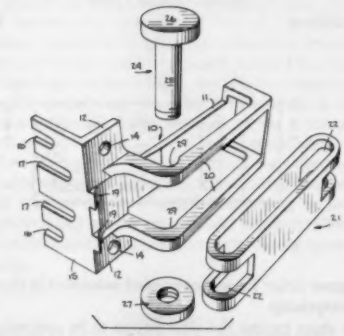
G. second adjustment means movably mounted on said support and engagable with said locking pawl during its movement from said second position to said first position to locate said abutment surface in a predetermined position spaced from said path of movement of said latch subassembly, said first and second adjustment means cooperating to limit the amount of movement of said pawl between said first and second positions and defining the location of said pawl in said first and second positions, whereby the latch may be adjusted for differing thermal conditions in a variety of ovens and the like.

4,174,861

EXTENSIBLE LOCK MECHANISM

Jeffrey P. Drake, Pitney Rd., Mendham, N.J. 07945

Filed Feb. 17, 1978, Ser. No. 878,777
Int. Cl.[2] E05C *17/10*
U.S. Cl. 292—269 **10 Claims**



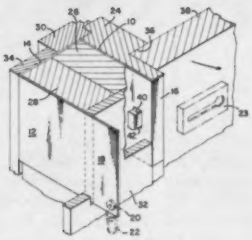
1. In a locking device for use with a dead bolt device, one of which devices is mountable on a door and the other on a jamb, for cooperation to maintain the door in locked condition and to release it from locked condition, the combination comprising: a backing plate formed with a body and spaced apart parallel guides projecting outwardly of said body to define therewith a recess and a pair of vertically aligned slots, a slide adapted to be slidably positioned between said guides and within said recess and to extend beyond an open end thereof, said slide having an elongate aperture therethrough adapted to receive

dead bolt means projectable and retractable by the dead bolt device, and pin means extending through said recess and aligned slots and said aperture.

4,174,862
DOOR FRAME PROTECTOR

Charles F. Shane, 3003 Mountain View Ave., Renton, Wash. 98055

Filed Feb. 4, 1977, Ser. No. 765,838
Int. Cl.² E05C *21/00*
U.S. Cl. 292—346 **6 Claims**



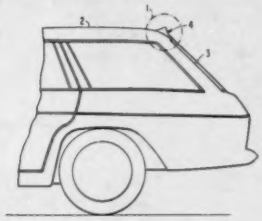
1. In a door frame assembly having a hinged door, a door frame member having one side face thereof adjacent a free end face of said door in its closed position and a second side face on the opposite side of said door frame member, a door frame support member extending generally parallel to said second side face of said door frame member and providing structural support therefor, said door having a retractable bolt extending from the free end face thereof and engageable in an opening in said door frame member, said door frame member having a position adjacent said opening which is subject to a splitting force from said bolt during an attempt to force the door open, a door frame protector comprising; a platelike member having two spaced apart portions projecting in opposite directions in substantially parallel relation, and an intervening portion extending between said spaced apart portions in substantially perpendicular relation therewith, said intervening portion being located between said door frame support member and said second side face of said door frame member, one said spaced apart portion being secured to the door frame support member with the other said spaced apart portion in force bearing engagement with said portion of the door frame member which is subjected to a splitting force during an attempt to force the door open.

4,174,863
AIR GUIDE INSTALLATION

Hans Götz, Böblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 846,256
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2649953
Int. Cl.² B62D *37/02*
U.S. Cl. 296—1 S **21 Claims**

1. An air-guide installation for motor vehicles, comprising profile bar means arranged at a vehicle outer body panel means within a transition area between a roof of the motor vehicle and rear portion thereof and extends in a vehicle transverse direction, characterized in that the profile bar means is effective as a spoiler for reducing air resistance in a first position wherein a bottom side of the profile bar means contacts the vehicle outer body panel means within the transition area and projects outwardly therefrom, and in that means are provided for selectively displacing the profile bar means from the first position to a second extended position away from the outer body panel means in the transition area so that an air-guide

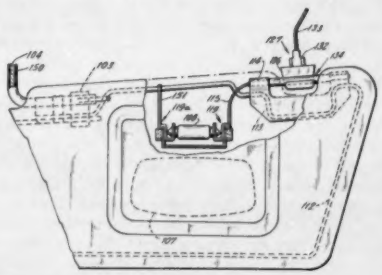


channel results between the outer body panel means and the bottom side of the profile bar means.

4,174,864
LIGHTED SUN VISOR FOR VEHICLES

Lothar Viertel, Wuppertal, and Manfred Nowak, Solingen, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 866,992
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703447
Int. Cl.² B60J *3/02*
U.S. Cl. 296—97 H **18 Claims**



1. Illuminating means for a sun visor having a visor body and a main swivel bearing on said visor body for swivelingly supporting said visor body and also having a counterbearing shaft supported on said visor body away from said main swivel bearing and a counterbearing housing attachable to a relatively stationary support that is separate from said visor body; said counterbearing shaft being detachably connected to said counterbearing housing upon motion of said visor body around said main swivel bearing toward said counterbearing housing, said illuminating means comprising:

a first contact element carried in said counterbearing housing; said first contact element being connectable to an electric source; a second contact element carried by said counterbearing shaft; said second contact element being engageable with said first contact element on movement of said visor to bring said counterbearing shaft into said counterbearing housing;

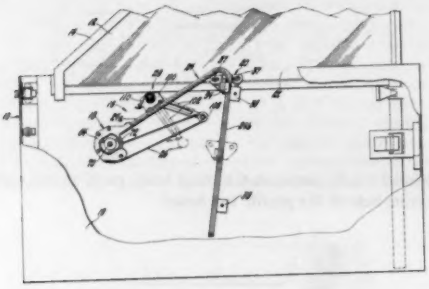
a light source carried on said visor body and being electrically connected with said second contact element; said light source being further connected to electric ground.

4,174,865

WINDOW REGULATOR MECHANISM

Juozas Doveinis, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 3, 1978, Ser. No. 921,729
Int. Cl.[2] E05F 5/10
U.S. Cl. 296—146 2 Claims



1. In a window regulator mechanism for use with an automotive door having spaced inner and outer panels, a window frame, and a window pane adapted to being slidably mounted in the window frame; an actuator assembly mounted in the door on the inner panel; a bracket assembly mounted on the window pane at a central location along the bottom edge thereof; a track including a first section operatively connected at one end thereof to the actuator assembly and extending therefrom to a point adjacent the bracket assembly when the window pane is in a closed position in the window frame, and a substantially vertically oriented second section integral with the first section and secured to a bottom portion of the inner panel, and a tape slidably mounted in the track and having one end thereof extending beyond the actuator end of the first track section, through the actuator assembly, and attached to an outer wall of the actuator assembly, the tape having equally-spaced perforations formed along the entire length thereof, the actuator assembly including a rotatable shaft and toothed means operatively connected to the shaft for meshing with the tape perforations for slidably reciprocally moving the tape along the first and second track sections, and the bracket assembly including connector means for connection with the other end of the tape for driving the bracket assembly and, hence, the window pane along a path parallel to the second track section intermediate the door panels in response to rotation of the shaft; the improvement comprising a counterbalance support member secured to the first track section at an intermediate point therealong; a counterbalance arm pivotally mounted at one end thereof in the support member and extending therefrom toward the second track section; a tape guide rotatably mounted on the other end of the arm and about which the tape is circumscribed and a counterbalance spring mounted in the support member for urging the arm away from the actuator assembly to maintain the tape taut and thereby counterbalance the weight of the window pane.

4,174,866

CARRIER READILY ATTACHABLE TO A SUPPORT

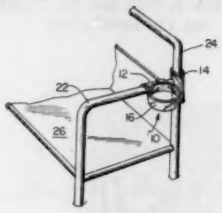
William C. Rhyan, Ft. Lauderdale, Fla., assignor to Clarke Carrier Corporation, Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 785,173, Apr. 6, 1977, abandoned. This application Sep. 26, 1977, Ser. No. 836,715
Int. Cl.[2] A47C 7/62
U.S. Cl. 297—194 8 Claims

1. An article supporting member adapted to be used with a wheelchair comprising:

an article retaining frame including a substantially circular ring member with an open top and a bottom on which an article may be positioned, said ring member including an upwardly projecting wall being of a height sufficient to prevent the tipping of an article releasably positioned on said bottom support;

said article retaining frame including a primary attaching arm comprising a substantially horizontally disposed primary plate member upon which is secured said ring member, said primary plate member including a substantially hooked attaching member adapted to releasably attach to a horizontally disposed member of a wheelchair;



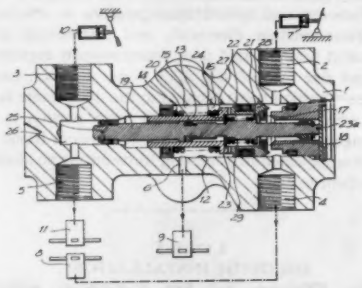
said article retaining frame further including a secondary attaching arm comprising a substantially vertically disposed secondary plate member secured along another edge of said substantially horizontally disposed primary plate member, said secondary plate member including a substantially hooked attaching member adapted to releasably attach to a vertically disposed member of a wheelchair.

4,174,867

BRAKE FORCE REGULATOR FOR A MOTORCYCLE HYDRAULIC BRAKE SYSTEM

Heinrich Oberthür, Offenbac-Rumpenheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,927
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1977, 2743204
Int. Cl.[2] B60T 11/20
U.S. Cl. 303—6 C 4 Claims



1. A brake force regulator for a motorcycle hydraulic brake system having a rear-wheel brake and a first front-wheel brake adapted to be actuated by a pedal-operated master cylinder and a second front-wheel brake adapted to be actuated by a hand-operated master cylinder, wherein the pressure applied to said rear-wheel brake is adapted to be reduced by said brake force regulator dependent on the pressure generated by said hand-operated master cylinder, said brake force regulator comprising:

a stepped piston slidable within a stepped bore of a housing against the force of a first spring, said stepped piston having a first effective area exposed to pressure from said pedal-operated master cylinder and a second effective area smaller than said first effective area exposed to pressure in said rear-wheel brake;

a seal carried by said stepped piston adjacent said first effective area;

a control piston disposed within said stepped piston having a collar thereon adjacent said seal such that displacement of said stepped piston in opposition to the force of said first spring causes said collar and said seal to abut each other and interrupt a pressurized-fluid connection between said pedal-operated master cylinder and said rearwheel brake, said control piston further having an effective area exposed to pressure from said handoperated master cylinder, said effective area of said control piston having a force applied thereto in a direction toward said seal; and

a stop secured to said housing within said stepped bore adjacent said seal against which said stepped piston and said control piston are held by spring force in their rest position.

4,174,868

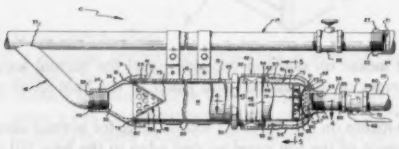
APPARATUS FOR PNEUMATICALLY APPLYING MATERIAL TO AN OBJECT

John M. De Nardo, 1044 Amherest St., Buffalo, N.Y. 14216

Filed Aug. 25, 1977, Ser. No. 827,478

Int. Cl.[2] B65G *53/10*

U.S. Cl. 406—76 **7 Claims**



1. Apparatus for pneumatically applying material to an object, said apparatus being adapted to be connected to a source of compressed air, said apparatus comprising:

a main conduit having an open first end arranged to be supplied with a flow of compressed air from said source, and having an open second end through which material is to be discharged;

a supply conduit having an open first end communicating with said main conduit and having an open second end;

a tubular casing having a first end connected to said supply conduit second end and having a second end;

a tubular wall arranged within said casing and having open first and second ends and adapted to contain a quantity of said material therewithin, said wall first end being in communication with said main conduit through said supply conduit;

a piston operatively arranged within said tubular wall for sliding movement therealong, said piston having a first face arranged to act on material within said tubular wall and having an opposite second face;

a pressurizing conduit connected to said casing second end and communicating said wall second end with said source and selectively operable to apply pneumatic pressure to said piston second face to displace said piston along said tubular wall and to cause extruded material to enter said main conduit; and

a diffuser mounted on said casing between said pressurizing conduit and piston and operable to diffuse a flow of compressed air delivered therethrough;

whereby extruded material entering said main conduit may be propelled therealong by said flow of compressed air therethrough, and may be discharged through said main conduit second end.

4,174,869

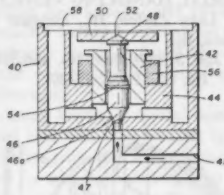
ELECTRO-HYDRAULIC BRAKE ACTUATING SYSTEM

Larry W. Hipps, 506 Colorado St., Sherman, Tex. 75090

Division of Ser. No. 742,854, Nov. 18, 1976. This application Apr. 24, 1978, Ser. No. 899,262

Int. Cl.[2] B60T *13/10, 7/20*

U.S. Cl. 303—10 **2 Claims**



1. An electromagnetic variable valve means for use in a hydraulic braking system comprising:

(a) a valve housing having an inlet and an outlet;

(b) a valve stem block within said valve housing and having a valve stem aperture therethrough;

(c) a valve stem slidably mounted within the valve stem aperture of said valve stem block and having a first end and a second end, said first end being conical in shape;

(d) a plate of magnetic material adjacent the second end of said valve stem;

(e) a conical valve stem seat adjacent said inlet for receiving said first end of said valve stem;

(f) electromagnet means positioned annularly around said valve stem block; and

(g) control means for supplying variable electric current to said electromagnet means to thereby selectively move said plate toward said electromagnet means and said first end of said valve stem toward said valve seat.

4,174,870

MULTI-PART ANTIFRICTION BEARING CAGE

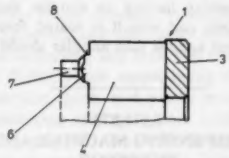
Klaus Kispert; Werner Manger, and Paul Weineck, all of Schweinfurt, Fed. Rep. of Germany, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 746,943, Dec. 2, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,114

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 7539626[U]

Int. Cl.[2] F16C *33/46*

U.S. Cl. 308—217 **13 Claims**



1. An antifriction bearing cage comprising a plurality of parts centered and secured radially with respect to one another and axially secured together, wherein one of said parts includes a plurality of webs, one end of each web terminating in a common ring, the other ends of each web including one centering projection, each projection having a first defined outer surface converging toward a pin arranged thereon, said centering projection having a greater cross-section than said pin, another of said parts being a cover part, said cover part, on the side thereof pointing towards said first part, having an annular

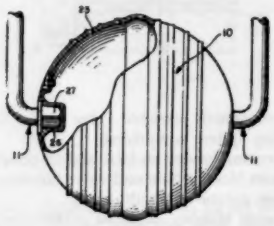
recess for receiving said centering projections, the portion of said recess facing said web having converging lateral walls dimensioned to be engaged by said centering projections, and a plurality of openings in said cover part for receiving said pins.

4,174,871

MATERIAL HANDLING VEHICLE

John E. Brannan, Lake Zurich, Ill., assignor to Ballbarrow Corporation, Itasca, Ill.

Filed Jan. 3, 1978, Ser. No. 866,381
Int. Cl.[2] F16C *33/20*
U.S. Cl. 308—238 **2 Claims**



1. A stub axle assembly for mounting a vehicle body on a supporting member, comprising:
   a. a horizontally disposed stub axle,
   b. a closed and flat bottom receptacle formed in a molded plastic side of said supporting member and having polygonal cross-section side walls between the open end of the receptacle and its bottom, and
   c. a bushing sub-assembly seated in said receptacle,
   d. said bushing sub-assembly including a molded plastic outer bushing having a flat bottom and an outer surface with a polygonal cross-section whereby when the outer bushing is seated in the receptacle it cannot rotate.
   e. the bottom of said outer bushing resting against the bottom of said receptacle when the outer bushing is seated.
   f. said bushing sub-assembly further including a molded plastic inner bushing having a cylindrical side wall and seated within said outer bushing,
   g. said inner bushing having a flat bottom which rests against and rotates on the bottom of said outer bushing,
   h. said stub axle being seated in said inner bushing and having means thereon for locking it to said inner bushing so that said outer bushing and said supporting member rotate together relative to said inner bushing and said stub axle,
   i. said outer bushing having an annular shield formed around its open end opposite its bottom and seated in a recess in the side of said supporting member, and
   j. said inner bushing having an annular shoulder formed around its open end which is seated freely within the confines of and against said annular shield on said outer bushing.

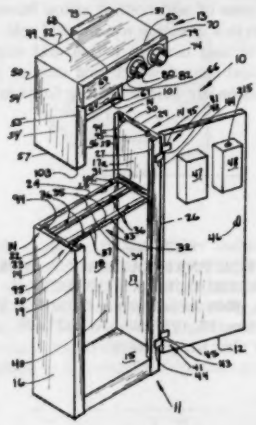
4,174,872

BEVERAGE DISPENSING MACHINE AND CABINET THEREFOR

Herman S. Fessler, Coon Rapids, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Apr. 10, 1978, Ser. No. 895,096
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—290 **55 Claims**

1. A beverage dispensing machine cabinet, comprising:
   a. a cabinet base having
      (1) a bottom,
      (2) a short side panel attached to the bottom,
      (3) a rear panel attached to the bottom and the short side panel,
      (4) a tall side panel attached to the bottom and the rear panel, said tall side panel being of greater height than said short side panel, and
      (5) a hinge for a cabinet door, said hinge being mounted to one of said side panels;
   b. a cabinet door pivotally mounted to said base by said hinge;
   c. a removable cabinet top having
      (1) a top panel with first and second side edges,
      (2) a side panel connected to the top panel first side edge,



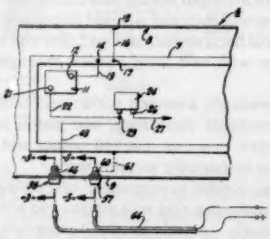
      (3) means on said top cap side panel for normal securement of the top cap side panel to the base short side panel, and
      (4) means on the top panel second edge for normal securement of the top panel second edge to the base tall side panel; and
   d. fastener means securing said top cap to said base, said fastener means being inoperably renderable for releasing the top cap from the base.

4,174,873

ELECTRICAL CONNECTOR FOR A VEHICLE

Jerry D. Hargett, 9460 Tegner Rd., and Alfred C. Nash, 19577 Crane Ave., both of Hilmar, Calif. 95324

Filed Oct. 23, 1978, Ser. No. 953,571
Int. Cl.[2] H01R *33/00*
U.S. Cl. 339—10 **5 Claims**



1. An electrical connector for a vehicle having a storage battery and a body panel with first and second openings therein comprising a first conducting stem having an axial recess therein, an insulator head on said first stem having one portion of a size to abut one side of said panel and having another portion of a size to pass into said first opening, first threads on said first stem of a size to pass through said first opening, a first nut rotatable on said first threads and disposed on the other side of said panel, first means for establishing electrical conti-

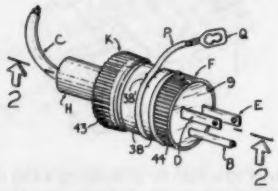
nuity between said first stem and one pole of said storage battery, a second conducting stem having an axial recess therein, a second enlarged insulator head on said second stem of a size to abut said one side of said panel around said second opening, second threads on said second stem of a size to pass through said second opening, a second nut rotatable on said second threads and disposed on said other side of said panel, and second means for establishing electrical continuity between said second stem and the other pole of said storage battery.

4,174,874

ELECTRIC PLUG

Hop Lee, 2425 24th Ave., San Francisco, Calif. 94116

Filed Mar. 15, 1978, Ser. No. 886,669
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 P **2 Claims**



1. In an electric plug:
(a) a terminal carrier for supporting a pivoted "ground" terminal and two electrodes;
(b) a cable receiving sleeve with the "ground" wire and two other wires extending beyond the cable casing and being received in three radially extending grooves in said carrier so that when the sleeve abuts the terminal carrier, the three wires will be gripped in the radial grooves;
(c) said terminal carrier having three projections with a bore extending through each one, each bore communicating with one of the radial grooves and receiving the bare wire strands of the wire in that groove, the wire strands of each wire extending over the outer end of its particular projection with the ends of the strands being received in recesses in the terminal carrier, said "ground" terminal and said two electrodes having portions in electrical contact with their associate bare wire strands that extend over the outer ends of the projections;
(d) an end cap for receiving said terminal carrier and having openings through which the "ground" terminal and two electrodes can extend; and
(e) a coupling connector for receiving said sleeve and being connectible to said end cap for enclosing said terminal carrier and holding said "ground" terminal and two electrodes in electrical connection with their respective bare wire strands.

4,174,875

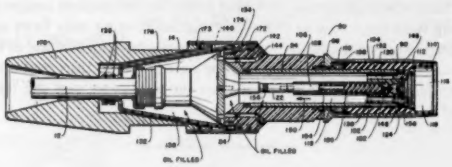
COAXIAL WET CONNECTOR WITH SPRING OPERATED PISTON

Jeffrey V. Wilson, Camarillo; James H. Schaefer, Del Mar; Anthony A. Glowacz, Northridge, and Jack Bayha, Canoga Park, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1978, Ser. No. 910,249
Int. Cl.[2] H01R *17/06*
U.S. Cl. 339—91 P **56 Claims**

1. An electrical coaxial wet connector, including a male and a female section for mating which produces a nearly perfect impedance match while maintaining a coaxial mode of signal propagation, comprising:

a. a female housing having a central opening therein and a longitudinal axis;
b. a female inner conductor disposed within said female housing along the longitudinal axis thereof;
c. a female outer conductor disposed within said female housing concentric with said inner conductor, said female outer conductor projecting outwards from said female inner conductor such that an interconnection space is formed within said female outer conductor, said female outer conductor having a termination end;
d. female dielectric means disposed between said inner and outer female conductors for providing electrical insulation therebetween;
e. a male housing having a central opening therein and a longitudinal axis, said male housing interfitting with said female housing with said female housing being partially surrounded by said male housing after mating;
f. a male inner conductor disposed within said male housing along the longitudinal axis thereof;
g. a male outer conductor disposed within said male housing concentric with said inner conductor, said male inner conductor projecting outwards from said male outer conductor, said male outer conductor adapted to receive said female outer conductor in electrical connection therewith;
h. male dielectric means disposed between said inner and outer male conductors for providing electrical insulation and a water-tight seal therebetween;



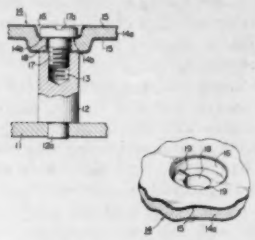
i. male facing means disposed concentric with said male outer conductor between said male outer conductor and said male housing, said male facing means forming a water-tight seal therebetween;
j. female facing lip means disposed concentric with said female outer conductor between said female outer conductor and said female housing, said female facing means forming a water-tight seal therebetween;
k. shuttle piston means disposed within said interconnection space for receiving said male inner conductor and electrically interconnecting said male and female inner conductors, said shuttle piston means being slidable within said interconnection space, said piston means having a front side for receiving said male inner conductor and a back side for engaging said female inner conductor;
l. seal means disposed within said interconnection space adjacent said female outer conductor termination end for providing a water-tight seal between said shuttle piston means and said female outer conductor before mating and between said male inner conductor and said female outer conductor after mating, thereby preventing water from entering said interconnection space rearward of said seal means;
m. spring bias means for maintaining said shuttle piston means in abutting relationship with said seal means before mating and for automatically returning said shuttle piston means to said abutting relationship during unmating.

4,174,876

MOUNTING MECHANISM FOR ENCLOSURE

Yasutaka Tsuchihashi, Tokyo, and Tatsuhiko Omoto, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 912,085
Claims priority, application Japan, Jun. 14, 1977, 52-76760[U]
Int. Cl.[2] H01R 3/04
U.S. Cl. 339—96 6 Claims



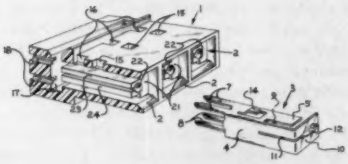
1. A mounting assembly for an enclosure comprising a conductive baseplate on which parts are to be mounted, a conductive enclosure having an insulating coating and adapted to be mounted on the baseplate, a conductive screw for securing the enclosure to the baseplate, said screw having a threaded body integrally joined to a head adapted to facilitate twisting of said threaded body into said baseplate, and a small projection on the surface of the enclosure and located in a region thereof which is adapted to engage the bottom surface of the head of the screw joining said threaded body, the projection cooperating with the screw to remove insulating coating only from said projection as the latter is engaged by the bottom surface of the screw head when the screw is being tightened, thus providing an electrical connection between the enclosure and the baseplate.

4,174,877

CONNECTOR FOR FLAT CABLE

Wilhelmus T. Foederer, Henkelbrits 40, Best, Netherlands

Filed Dec. 19, 1977, Ser. No. 861,974
Int. Cl.[2] H01R 11/20
U.S. Cl. 339—97 P 1 Claim



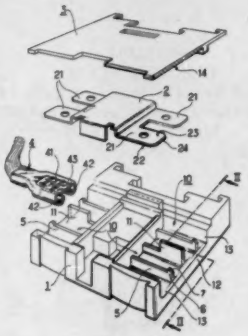
1. A connector comprising a dielectric casing having plural cavities and a conductive terminal in each cavity, said casing having an integral guide block disposed longitudinally in each cavity, said guide block comprised of spaced rails having a pin-receiving passage therebetween, said casing further having a transverse slot for a flat cable, each terminal having an elongated mounting portion in the shape of a channel with side walls and a center strip, tines projecting from said side walls at one end of the mounting portion, said side walls being slidable on said rails, said center strip having a length extending beyond and bent across the mounting portion at its other end, said length having a longitudinal slot and a pin-receiving hole formed as an enlargement of the slot.

4,174,878

SECURITY STRUCTURE FOR POSITIONING A CLIP ON A CONNECTOR TAB

Jean Debaigt, Maisons Laffitte, France, assignor to CGEE Alsthom, Levallois Perret, France

Filed Sep. 21, 1978, Ser. No. 944,661
Claims priority, application France, Oct. 7, 1977, 77 30276
Int. Cl.[2] H01R 9/18
U.S. Cl. 339—198 R 2 Claims



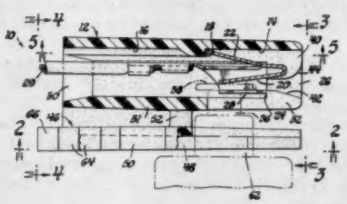
1. In a security structure for positioning a clip on a generally flat tab disposed in a cavity formed in the insulating housing of a connector and defined by opposed, spaced walls, wherein one of said walls of the cavity has a rib which extends against one of the large surfaces of the tab, said rib having, at its clip insertion orifice end, a spur which covers the end of the tab up to a level flush with its other large surface of the tab, the clearance between said other large surface and the other facing wall of the cavity being less than the total thickness of the clip.

4,174,879

ELECTRICAL CONNECTOR

Lyle B. Suverison, Fowler, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 28, 1978, Ser. No. 919,802
Int. Cl.[2] H01R 9/12, 13/98, 13/54
U.S. Cl. 339—217 S 2 Claims



1. In a hard plastic electrical connector body having a metal terminal secured therein and including an open-ended notch formed in a wall thereof adjacent the terminal for sliding engagement with an external terminal post, the improvement comprising a lock member including a rigid arm integrally formed along one edge of said connector body wall and a movable arm integrally pivotally connected at a midpoint thereof to the connector body wall and the rigid arm and extending along the opposite edge of said wall, an inwardly projecting locking corner formed on the end of the movable arm adjacent the open-ended notch and adapted to being flexed outwardly by the movement therepast of the external terminal post upon the forcing of the connector body onto the terminal post for locking engagement with the terminal, and means formed on the outer edge of the other end of each of the rigid and movable arms adapted to pivot the locking corner

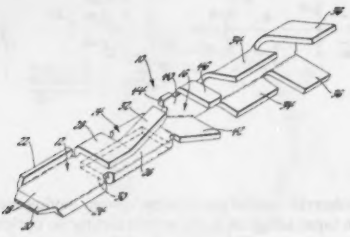
outwardly away from the rigid arm in response to manual depression of said means for release of the connector body from the terminal post.

4,174,880

SPADE TERMINAL

Harold G. Hawkins, Bristolville, Ohio, and Andrew F. Rodondi, Sharpsville, Pa., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1978, Ser. No. 872,474
Int. Cl.[2] H01R *9/00*
U.S. Cl. 339—217 S **3 Claims**



1. A spade terminal of unitary sheet metal construction comprising a forward portion and a multi-layered median portion,

said median portion having a flat section which is generally rectangular in plan form and a wing portion which is integrally attached to one longitudinal side of the flat section and folded over onto a surface thereof,

said forward portion comprising a flat section coplanar with the flat section of the median portion and an upstanding flange at its longitudinal side corresponding to the one longitudinal side of the median portion, said flange having a height substantially equal to the thickness of the wing portion, and

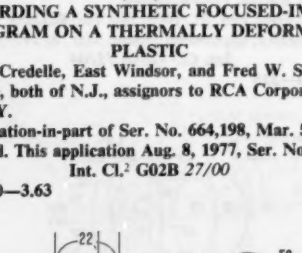
said wing portion terminating short of the opposite longitudinal side of the flat section whereby the longitudinal edges of the forward portion are of the same thickness as the corresponding longitudinal edges of the median portion.

4,174,881

RECORDING A SYNTHETIC FOCUSED-IMAGE HOLOGRAM ON A THERMALLY DEFORMABLE PLASTIC

Thomas L. Credelle, East Windsor, and Fred W. Spong, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 664,198, Mar. 5, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,625
Int. Cl.[2] G02B *27/00*
U.S. Cl. 350—3.63 **1 Claim**



1. In an image recording medium for improving the contrast ratio of a synthetic focused image hologram produced by a white light image, said medium including a conductor layer carried by a substrate, the improvement comprising:

a photoconductor layer disposed upon said conductor layer; and

a thermoplastic layer having an index of refraction substantially equal to the index of refraction of said photoconductor layer, one face of said thermoplastic layer being disposed upon said photoconductor layer to form a boundary therebetween that has a deformation in the shape of a uniform diffraction grating;

the other face of said thermoplastic layer opposite from said boundary having a deformation corresponding to an image of said white light;

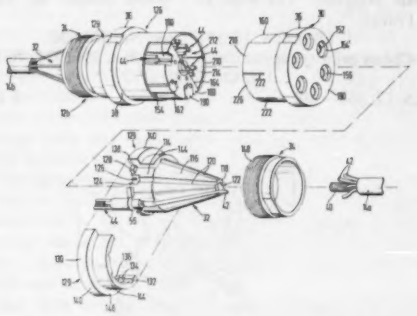
whereby the contrast ratio of said hologram on said other face of said thermoplastic layer is improved by the substantial absence of diffraction of light from said barrier defined by said layers having substantially equal indices of refraction.

4,174,882

SINGLE OPTICAL FIBER CONNECTOR

Ronald L. McCartney, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 682,274, May 3, 1976, Pat. No. 4,008,390, which is a continuation-in-part of Ser. No. 629,004, Nov. 5, 1975, abandoned. This application Dec. 22, 1977, Ser. No. 863,573
The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 **4 Claims**



1. A fiber optic connector for coupling optical fibers comprising:

a pair of mating connector members each having a bore therein slidably receiving a termination pin adapted to be connected to an optical fiber, said termination pins being laterally aligned with each other when said connector members are mated and having mating end faces;

an annular groove in each said termination pin;

an annular recess in the wall of each said bore surrounding the groove in the pin in said bore, said recess providing an annular forwardly facing shoulder;

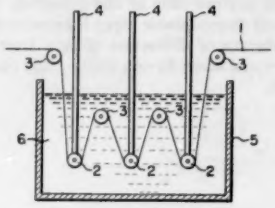
a resilient ring mounted in each said groove and extending outwardly into its corresponding recess in front of said shoulder; and

when said connector members are mated, said mating end faces of said pins axially abut each other and said forwardly facing shoulders engage said rings to provide a resilient compression force for contact abutment and relief for axial manufacturing tolerances.

4,174,883
REAR PROJECTION SCREEN

Hiroyuki Imataki, Tokyo; Hitoshi Toma, Kawasaki, and Noboru Narita, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 543,432, Jan. 23, 1975, abandoned. This application Dec. 14, 1977, Ser. No. 860,458
Claims priority, application Japan, Jan. 29, 1974, 49-12410
Int. Cl.[2] G03B *21/60*
U.S. Cl. 350—126 28 Claims

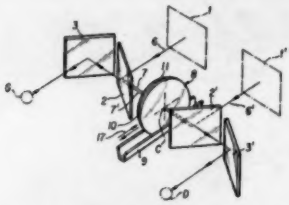


1. A rear projection screen which comprises a light scattering member composed of a melted mixture of at least two high polymers obtained by melting and then mixing said high polymers, wherein the absolute value of the difference between the refractive indexes of the high polymers is from 0.01 to 0.25.

4,174,884
OPTICAL VIEWER WITH ADJUSTABLE ANGULAR CONVERGENCE

Alain Weissler, "Les Muriers", 91800, Boussy, St. Antoine, France

Filed Jun. 16, 1977, Ser. No. 807,038
Claims priority, application France, Jun. 29, 1976, 76 19760
Int. Cl.[2] G02B *27/22*
U.S. Cl. 350—138 6 Claims



1. In a binocular optical viewing system for the visual observing of a pair of spaced images including optical devices defining a pair of light paths from the eyes to the images having parallel portions, including a pair of mirrors disposed in each said light path, each mirror pair having right-angularly related mirrors, with one said mirror being part transparent and part reflective and disposed at an angle of 45° to a said light path on the eye side thereof thereby to direct parallel light rays therefrom toward the eyes, said other mirror of each pair being on the image side of said path,

the improvement comprising,

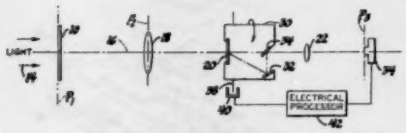
refractive optical member means disposed in said light paths and at 45° to said mirrors,

said refractive means being mounted for movement in a direction parallel to its plane and perpendicular to said light path thereat, whereby movement of said refractive means with respect to said mirrors shifts said parallel light path portions on the eye side of said mirrors to increase or decrease the distance therebetween.

4,174,885
FILTER ROTATOR FOR COHERENT OPTICAL CORRELATION SYSTEM

Bernard W. Joseph, Berkley, and Aaron D. Gara, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 16, 1978, Ser. No. 869,678
Int. Cl.[2] G06G *9/00*; G03H *1/16*
U.S. Cl. 350—162 SF 2 Claims



1. In a coherent optical correlation system having means to produce an input image in a plane intersecting an optical axis, means to produce a spatial transform of the image, and a hologram filter to be angularly oriented about said axis in relation to the spatial transform of the image wherein the hologram filter when properly oriented and exposed to the spatial transform of the image emits a correlation beam at a predetermined angle to the hologram filter and at an angle to the optical axis of the system, a filter rotator for angularly moving the filter about said axis comprising

a housing rotatable about the optical axis and carrying the hologram filter for rotation therewith,

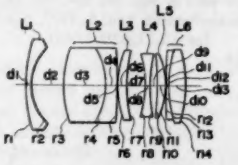
a first mirror carried by the housing at an off-axis location for intercepting the correlation beam projected from the filter, the mirror being oriented to direct the correlation beam along a path intersecting the optical axis, and

a second mirror carried by the housing at the location where the correlation beam intersects the axis and positioned to direct the correlation beam substantially along the axis.

4,174,886
INVERTED TELEPHOTO LENS SYSTEM

Akiyoshi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1978, Ser. No. 881,637
Claims priority, application Japan, Mar. 8, 1977, 52-25661
Int. Cl.[2] G02B *13/04*
U.S. Cl. 350—215 10 Claims



1. A wide angle lens system of an inverted telephoto type comprising six separate lens groups consisting, consecutively from the object to the image side, of:

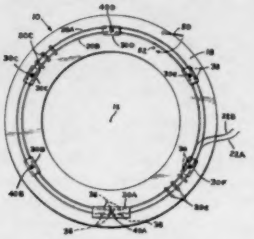
a first front group consisting of a negative meniscus single lens element convex to the object side;

a second group consisting of a positive doublet element formed by cementing two sub-elements having a cemented intermediate surface concave to the object side;

a third group consisting of a positive meniscus single lens element convex to the object side;

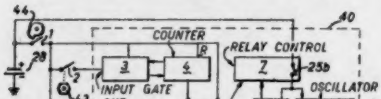
a fourth group consisting of a biconcave single lens element;
a fifth group consisting of one positive lens element; and
a sixth rear group consisting of one positive lens element, one of the positive lens elements of the fifth and sixth groups being a single lens element, while the other being a doublet element formed by cementing two sub-elements.

4,174,887
ROTATABLE STAGE FOR A CAMERA
Douglas T. Mesney, 23 E. 73 St., New York, N.Y. 10021
Filed Jan. 18, 1878, Ser. No. 870,358
Int. Cl.² G03B *15/00*
U.S. Cl. 352—87 **8 Claims**



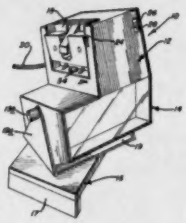
1. A rotatable stage for an object to be photographed comprising a base, a circular track on said base, said circular track having at least two conductive rails, a source of electric current connected across said two conductive rails, a plurality of trucks spaced about said track, at least one of said trucks being electric motorized and energized by electric current in said two conductive rails, each of said trucks having an upstanding support member, and a platform fixed to said support members.

4,174,888
AUTOMATIC FILM TRANSPORT MONITORING SYSTEM
Hans Hunn, Biberstein, and Georg Schwarz, Zurich, both of Switzerland, assignors to Canon, Inc., Tokyo, Japan
Filed Nov. 17, 1977, Ser. No. 852,220
Claims priority, application Switzerland, Nov. 26, 1976, 14898/76
Int. Cl.² G03B *1/60*
U.S. Cl. 352—170 **12 Claims**



1. Automatic film transport monitoring system for still and motion picture cameras, comprising
film movement sensing means (2, 43; 62) coupled to the film (54, 67) and generating at least one film movement pulse as the film advances in the camera, said film movement sensing means providing a predetermined number of output pulses corresponding to and representative of a predetermined length of film being advanced in the camera;
and a pulse count number evaluation circuit (3, 4, 6) connected to and controlled by said film movement sensing and pulse generating means (2, 43; 62) and providing an alarm output signal if said predetermined number of output pulses has not been attained.

4,174,889
TRAVEL MONITOR
Arnis E. Peters, LaCrosse, Wis., assignor to Northern Engraving Company, Sparta, Wis.
Filed Oct. 31, 1977, Ser. No. 847,257
Int. Cl.² G03B *21/11, 23/12*
U.S. Cl. 353—12 **6 Claims**



1. In a viewing device that provides an illuminated enlarged display of a microimage, that has been selected from an elongated film strip which carries such images and is selectively moveable within a cassette between spaced reels carried within said cassette;
the improvement of such a viewing device for use within an automotive vehicle, comprising in combination:
the viewer including housing means; illuminating means including a light source and light collimating means, enclosed within said housing means and for directing and collimating light from said light source along a first optical axis, means for directing the collimated light through a selected portion of the film and the cassette therefor, and optical projection means, including lens means, mirror means, and a two element viewing screen sandwich that includes a Fresnel lens, in said housing means and for receiving the light that has passed through the film for passage through said lens means, along a second folded optical axis that lies in a projection plane that is transverse to said first axis, against spaced mirrors to effect enlargement of the illuminated image and to project said enlarged image onto said two-element viewing screen sandwich that includes a Fresnel lens;
said housing means being shaped and constructed to provide, on the exterior of said housing means, an open sided recess that is edge-bounded by portions of said housing means and which is adapted to receive thereinto a cassette, said recess being aligned both with said first axis and with said projection plane;
hooded light turning means on said housing means positioned within the confines of said recess for directing light from said illuminating means into said projection plane, said hooded means and the edge boundaries of the recess cooperating to provide a shaped recess for receiving thereinto a film-carrying cassette that is shaped to cooperate with said recess and hooded light turning means so as to be received and held in the recess at a pre-determined attitude, with a selected portion of the film strip positioned between said light turning means and said projection means, said arrangement permitting a person to selectively load a cassette into the viewer without opening the viewer; and
means carried by the housing means and operatively associated with the reel-mounted film strip, when the cassette is operatively positioned within said recess, for selectively moving the film strip transversely of said second optical axis, whereby the enlarged display of microimages from said film strip may be viewed by a person controlling the vehicle for purposes of selecting a course for said vehicle from said enlarged display.

4,174,890

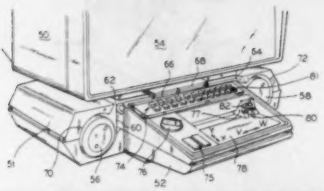
ELECTRONICALLY CONTROLLED MICROFILM PHOTOGRAPHIC IMAGE UTILIZATION DEVICE

Delmar R. Johnson; John R. Flint, both of Barrington; Thomas R. Wells, Des Plaines; Rolf B. Erikson, Lincolnwood, and Bruce A. Rady, Palatine, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 711,180, Aug. 3, 1976, Pat. No. 4,110,020. This application Jan. 25, 1978, Ser. No. 872,093

Int. Cl.[2] G03B *23/08, 23/12, 21/14;* **G06K** *7/00*

U.S. Cl. 353—26 A **23 Claims**



1. A microfilm photographic image utilization device for projecting a large library of images onto a viewing area responsive to a three-dimensional selection process, said device comprising a roll of film wound on first and second reels and carrying said large library of images, means for transporting said roll of film in either of two directions from one of said reels to the other of said reels, said film having a plurality of images printed thereon in individually identified discrete photographic areas, each of said photographic areas having an individually associated bar code address printed on the film, each of said bar codes comprising an aligned series of wide and narrow marks separated by spaces, each narrow mark having the same width, each of said wide marks being twice as wide as said narrow marks, the width of each of said spaces being equal to the width of said narrow marks, the individual area identification addresses given by said bar codes constituting an index for a first selective dimension, each photographic area having a plurality of individual images arranged in an orthogonal array, the X and Y axes of said orthogonal array constituting second and third selective dimensions, means responsive to detection of a selected bar code identification of any one of the individual area identifications for automatically driving said transport to reel said film in either of said two directions to position any selected one of said photographic areas during a first dimensional selection in a reading location in said large libray, and manually movable means comprising a movable lens which is thereafter moved in X and Y dimensions in a manual search mode for projecting a selected image from the photographic area which is then positioned within said viewing area, said lens having an angle which is wide enough to project an image from a most remote part of the photographic area onto said viewing area.

4,174,891

MICROFILM READER/PRINTER

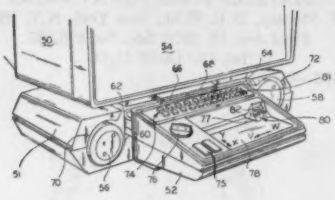
John R. Flint, Barrington, and Bruce A. Rady, Glencoe, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 741,929, Nov. 15, 1976, abandoned. This application Sep. 6, 1978, Ser. No. 939,945

Int. Cl.[2] G03B *23/12, 23/08;* **G06K** *7/00, 19/00*

U.S. Cl. 353—26 A **62 Claims**

1. A microfilm reader/printer having a viewing area for use with a web having thereon photographic areas which are individually identified by elongated codes including a series of marks with the elongated dimension of said series of marks being aligned and positioned along the edge of said web, and extending over a portion of the length of said web, each of said codes being positioned adjacent individually associated ones of said areas, means for transporting said web over a path through said reader/printer in either of two opposing directions which presents said marks in series to any point along the path of web travel, at least a pair of sensor means located adjacent said path for individually reading each of said codes in series as said web is being transported adjacent said sensor means, said sensor means reading said code responsive to transport of said web in either of said two directions with one of said sensors strobing the other of said sensors, means responsive to code reading by one sensor means under the control of the other sensor means for storing a code identifying a photographic area on said web, means for indicating a selected code, comparator means jointly



responsive to the codes read by said sensor means and said code-indicating means for comparing the sensed and indicated codes, and means for reversing the direction of web transport responsive to said comparing means detecting a change in the relationship between said compared codes which indicates that the desired photographic area has passed the viewing area, the strobing function performed by at least one of said sensor means reversing each time that the direction of web travel reverses.

4,174,892

AUTOMATIC FOCUSING SYSTEM

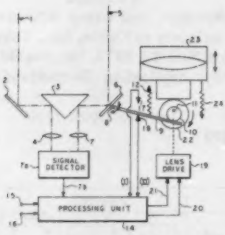
Noriaki Osawa, Tachikawa, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1978, Ser. No. 922,411

Claims priority, application Japan, Jul. 6, 1977, 52/80008

Int. Cl.[2] G03B *13/20*

U.S. Cl. 354—25 **11 Claims**



1. In a camera having a lens adapted to be automatically focused in response to focusing signals generated by coincidental signal outputs from a first photosensitive device receiving light from a subject via a stationary optical path and from a second photosensitive device receiving light from the subject via a scanning optical path, a method of automatically focusing the lens, comprising:

developing a first focusing signal by causing the scanning optical path to scan, from a first limit focusing position to a second limit focusing position, and developing a second focusing signal by causing the scanning optical path to re-scan from the second limit focusing position to the first limit focusing position;

computing the interval between the first and second focusing signals; and

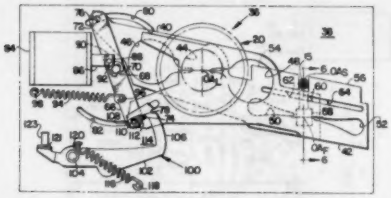
automatically positioning the lens in accordance with the computed interval.

4,174,893

EXPOSURE CONTROL SYSTEM FOR USE IN PHOTOGRAPHIC CAMERA APPARATUS

John P. Burgarella, Sudbury, and Peter P. Carcia, Reading, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 14, 1977, Ser. No. 860,639
Int. Cl.[2] G03B 7/14
U.S. Cl. 354—29 **22 Claims**



1. Photographic camera apparatus of the type having means for defining a film plane and an optical path for transmitting light from a scene along the optical path to expose photosensitive film located in the film plane, said apparatus comprising:

light detecting means, including a photodetector having a predetermined photosensitive surface, for receiving light from the scene and providing an output signal having an electrical characteristic which varies as a function of the intensity of the scene light incident on said photodetector's surface;

means for providing a first and a second light path for transmitting light from the scene to said photodetector's surface; each of said first and second light paths having light entrances which face the scene and are offset with respect to one another;

blade apparatus;

means for mounting said blade apparatus for displacement between a first arrangement in which said blade apparatus is simultaneously in light blocking relation to both the optical path and said first light path thereby precluding scene light from being transmitted along both the optical path and said first light path and in light unblocking relation to said second light path thereby allowing light from the scene to be transmitted along said second light path and onto said photodetector's surface, and a second arrangement in which said blade apparatus is simultaneously in light unblocking relation to both the optical path and said first light path and in light blocking relation to said second light path, said blade apparatus comprising first portions structured to define a primary varying aperture, aligned with the optical path, which changes from an initial value to a final value during displacement of said blade apparatus from its said first to its said second arrangement and to define a secondary varying aperture, aligned with said first light path, which also changes from an initial value to a final value during displacement of said blade apparatus from its said first to its said second arrangement, and at least one other portion adapted to block said second light path prior to said first portions defining said initial aperture value of said secondary varying aperture, said initial values of both said primary and secondary varying apertures occurring generally at the same time;

drive means actuable for displacing said blade apparatus between its said first and second terminal positions; and

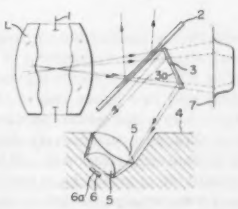
means energizable at least in part by a source of electrical energy for monitoring said output signal of said light detecting means and measuring scene brightness while said blade apparatus is in its said first arrangement and providing a discernible signal that has one characteristic which indicates that the scene brightness is below a predetermined level, for actuating said drive means when said scene brightness is above said predetermined level to displace said blade apparatus from its said first arrangement to provide said primary and secondary varying apertures aligned, respectively, with the optical path and said first light path thereby initiating an exposure interval during which scene light is transmitted substantially simultaneously along the optical path through said primary varying aperture and along said first light path onto said photodetector's surface through said secondary varying aperture, for integrating said output signal of said light detecting means beginning substantially at the commencement of said exposure interval, and actuating said drive means when the time integral of said output signal reaches a predetermined value to displace said blade apparatus to again block the optical path and said first light path thereby terminating said exposure interval, said blade apparatus serving to block said second light path during said exposure interval.

4,174,894

TTL METERING DEVICE IN A SINGLE LENS REFLEX CAMERA

Toru Fukuhara, Fujisawa, and Jun Shimomura, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 716,936, Aug. 23, 1976. This application Mar. 28, 1978, Ser. No. 890,967
Claims priority, application Japan, Sep. 1, 1975, 50-119221[U]; Sep. 5, 1975, 50-107099
Int. Cl.[2] G03B 7/00
U.S. Cl. 354—59 **11 Claims**



1. A TTL metering device in a single lens reflex camera for measuring light passed through the picture-taking objective lens of the camera, comprising:

a light-sensing element for receiving the light passed through said picture-taking objective lens and producing an output corresponding to the intensity of the light;

a jump-up mirror partly having a light-transmitting area through which part of the light passed through said picture-taking objective lens may be transmitted;

light diffusion means being positioned behind said jump-up mirror and diffusively reflecting the light transmitted through said light-transmitting area of said jump-up mirror to permit said light to reach said light-sensing element; and

optical means disposed between said light diffusion means and said light-sensing element;

said light diffusion means including:

light scattering means including a layer of electro-optical substance; and

control means for applying a voltage to said light scattering means to vary the scattering characteristic thereof.

4,174,895

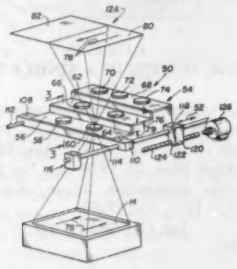
APPARATUS FOR PRODUCING MULTIPLE IMAGE FORMATS

Saul Fermaglich, 130 Overlook Ave., Hackensack, N.J. 07601, and Ivan Volent, 1600 Center Ave., Fort Lee, N.J. 07024

Filed Feb. 21, 1978, Ser. No. 879,152
Int. Cl.[2] G03B 5/02, 29/00
U.S. Cl. 354—76 **5 Claims**

1. Apparatus for producing photographic records of multi-

ple images in selected formats comprising an image display screen, an image-display station in a clearance position from said display screen, a multi-tier carriage having image-projecting lenses thereon disposed in an interposed position between said image display screen and said image-display station and operatively arranged to partake of movement having a transverse relation to said display station to provide selected positions correspondingly oriented transversely of said display station for images projected thereto by said carriage image-projecting lenses, said tiers of said carriage being at selected fixed distances from said display station effective to obtain a magnification in said projected images at said display station for the size desired for a selected format, and said image-projecting lenses of said carriage being in a cooperative ar-



rangement of at least two in number on one said tier and on another said tier in a cooperating arrangement of at least three in number so as to be effective in producing formats of two rows of images using said two lenses and of three rows of images using said three lenses, and means operatively effective to urge said carriage through a successively displaced select number of positions in transverse relation to said image-display station to thereby contribute to providing in said formats additional rows of images transversely oriented to said other rows and in a number corresponding to said positions, whereby with optimum minimum movement of said multi-tier carriage there is nevertheless obtained multiple images appropriately sized and position-located on said photographic record suitable for the format selected for the display of said multiple images.

4,174,896

ADAPTER FOR ELECTRONIC FLASH UNIT

Kazunori Mizokami, Hachioji, and Osamu Kawarada, Fuchu, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1978, Ser. No. 896,565

Claims priority, application Japan, Apr. 20, 1977, 52-50076[U]

Int. Cl.[2] G03B *15/05*

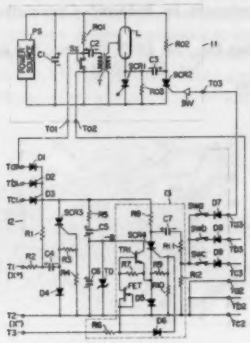
U.S. Cl. 354—132 **6 Claims**

1. An adapter connected between at least one electronic flash unit having a light adjustment circuit and a selected one of a plurality of still cameras of various types with means for generating respective light adjustment signals of different characteristics and each having an electronically-connected shutter mechanism including a synchro contact and a light adjustment signal output contact through which a light adjustment signal is transferred, said adapter comprising:

(a) a trigger circuit means for generating at least one trigger signal in response to the actuation of the synchro contact of the camera to start light emission of the electronic flash unit in response to the trigger signal;

(b) a signal converter circuit for converting the respective light adjustment signal transferred from the selected camera into a signal having characteristics suitable for the operation of the light adjustment circuit of the electronic flash unit; and

(c) a converted signal supplying means for supplying the signal converted by said signal converter circuit to the



light adjustment circuit of the flash unit in order to stop the light emission of the flash unit.

4,174,897

X-CLASS SYNCHRONIZATION CONTACT MEANS FOR ELECTRIC SHUTTERS

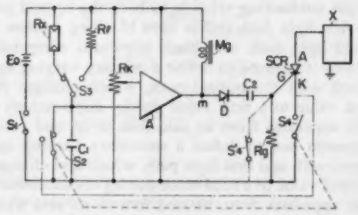
Kunio Matsumoto, Ageo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Sep. 21, 1977, Ser. No. 835,211

Claims priority, application Japan, Sep. 24, 1976, 128402[U]

Int. Cl.[2] G03B *15/05*

U.S. Cl. 354—133 **6 Claims**



1. An X-class synchronization contact means for electric shutters comprising an electromagnet capable of being converted from an energized state into a de-energized state to start a shutter closing motion, a flash synchronization contact capable of being operated by an electrical signal associated with said electromagnet when said electromagnet is de-energized, and a first switch which is connected to said synchronization contact and which functions to prevent said synchronization contact from passing an electric current for erroneous flash synchronization during at least any preliminary operation step for the shutter release and which permits said synchronization contact to pass an electric current for flash synchronization by said electrical signal at the time said electromagnet is de-energized only after said first switch is operated.

4,174,898

CAMERA

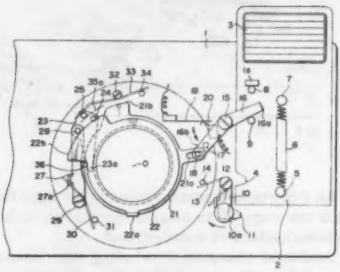
Yaichi Iijima, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 602,916, Aug. 7, 1975, Pat. No. 4,100,554. This application May 5, 1978, Ser. No. 903,218

Claims priority, application Japan, Aug. 13, 1974, 49/97026[U]

Int. Cl.[2] G03B *15/05*

U.S. Cl. 354—145 4 Claims



1. In a camera operable for both daylight and flashlight photography, provided with a diaphragm adjusting member and having a focusing ring, a changeover ring, and a guide number ring all coaxially and rotatably mounted about the optical axis of the camera, the improvement comprising a first cam on and rotatable with said focusing ring, a second cam on and rotatable with said guide number ring, means moving said changeover ring between two control positions, means engageably controlling said diaphragm adjusting member through said cams when said changeover ring is in one control position, and means effecting disengagement of said cams with said diaphragm adjusting member when said changeover ring is in the second control position.

4,174,899

FILM ADVANCE DEVICE FOR CAMERAS

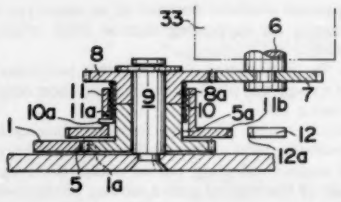
Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 9, 1978, Ser. No. 959,131

Claims priority, application Japan, Nov. 10, 1977, 52/135547

Int. Cl.[2] G03B *1/14*

U.S. Cl. 354—213 18 Claims



1. In a camera, a mechanism for advancing predetermined lengths of film comprising:

a rotatable drive member including a first hub;

a rotatable driven member including a second hub coaxial with said first hub;

means for rotating said drive member including said first hub;

means actuated by said driven member for advancing said film;

a helical resilient coupling coil engaging the outer peripheral faces of said hub whereby to transmit the rotation of said first hub to said second hub when said first hub is rotated in a first forward direction and to drive uncouple said hubs when said first hub is rotated in a second reverse direction; and

release means responsive to the advance of a predetermined length of said film for preventing the rotation of an end of said coupling coil whereby to effect the drive uncoupling between said hubs independently of the direction of rotation of said first hub.

4,174,900

CAMERA TRIPOD

Tatsuo Ina, Tokyo, Japan, assignor to Mitsuwa Shashin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,138

Claims priority, application Japan, Jun. 29, 1977, 52/85732[U]; Jun. 29, 1977, 52/85733[U]

Int. Cl.[2] G03B *17/00;* F16B *7/10, 7/14;* F16M *11/26*

U.S. Cl. 354—293 5 Claims

1. A support apparatus comprising a plurality of legs, each leg comprising at least a first and a second leg element with said second leg element telescopically inserted in and movable relative to said first leg element, each leg element being substantially U-shaped in cross section and having a base wall and generally perpendicularly extending side walls, carrier frame means disposed on the interior of said second leg element, said carrier frame means having a hollow interior, a base and side walls extending from said base, said base having an opening therein, a press member carried by said carrier frame means and extending into said opening in said base and being movable at least partially through said opening in said base of said carrier frame means, said base wall of said second leg element having an opening therein, said carrier frame means being disposed over said opening in said base wall of said second leg element, lever means pivotally mounted on the interior of said carrier frame means and engaging said press member to move said press member through said opening in said base wall of said second leg element and press against said base wall of said first leg element when said lever means is pivoted from a deactuated to an actuated position.

4,174,901

FILM SQUEEGEE MECHANISM OF AUTOMATIC FILM DEVELOPING APPARATUS

Nobuhiro Takita, and Tadashi Shintani, both of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

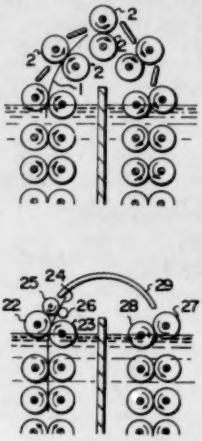
Filed Jun. 3, 1977, Ser. No. 803,219

Int. Cl.[2] G03D *3/08*

U.S. Cl. 354—322 4 Claims

1. A film squeegee mechanism for an automatic film developing apparatus including a plurality of processing tanks and a plurality of suitably disposed transport rollers adapted to transport a film medium through each tank and between the tanks in a proper order, wherein said squeegee mechanism is disposed between two of the processing tanks and comprises a squeegee

roller in contact with and rotated opposite to the direction of movement of the film medium, said squeegee mechanism being held by its own weight in frictional contact with and driven by



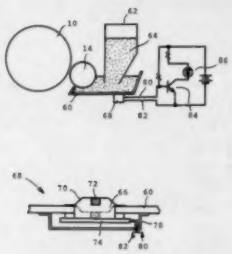
a transport roller whose contact point with the film is located above the liquid level of the tank from which the film is being transported.

4,174,902

DETECTION OF DEVELOPER POWDER AMOUNT CONTAINED IN A DEVELOPER RESERVOIR

Hiroshi Hamaguchi, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1977, Ser. No. 844,204
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DD **15 Claims**



1. In an electrophotographic copying machine wherein an image from a subject sheet is developed at a developing section through the use of developer powder contained in a developer reservoir, and the quantity of the developer powder contained in the developer reservoir is monitored and detected by a developer powder detection system, said developer powder detection system comprising:

a wall portion forming part of said developer reservoir, said wall portion having an opening formed therein;

a flexible film fixed to said wall so as to cover said opening formed in said wall, said flexible film being adapted to change its configuration based upon the quantity of the developer powder contained in said developer reservoir and

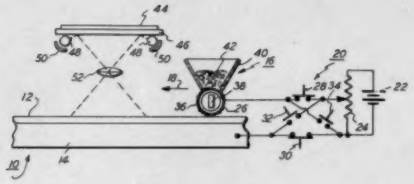
a detection means for detecting the changes in the configuration of said flexible film.

4,174,903

COMBINED PROCESSING STATION FOR USE IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1978, Ser. No. 892,610
Int. Cl.[2] G03G *15/22*
U.S. Cl. 355—3 CH **22 Claims**



1. An electrophotographic printing machine for reproducing at least one copy of an original document, including:

a photoconductive member; and

a combined charging-developing unit having conductive particles adhering to a surface thereof and being positioned so that the conductive particles contact said photoconductive member, said charging-developing unit being electrically biased to a first polarity and magnitude for charging at least a portion of said photoconductive member in a first mode with the conductive particles remaining substantially adhering to the surface of said combined charging-developing unit, said charging-developing unit being electrically biased to a second polarity and magnitude for developing an image recorded on said photoconductive member with the conductive particles in a second mode.

4,174,904

ELECTROPHOTOGRAPHIC COPYING APPARATUS FOR COPYING THICK AND THIN ORIGINALS

Hiroshi Murasaki, Sakai; Yuji Enoguchi, Osaka; Kenichi Wada, and Takao Fujiwara, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1977, Ser. No. 844,068
Claims priority, application Japan, Oct. 26, 1976, 51-129242
Int. Cl.[2] G03G *15/28*
U.S. Cl. 355—8 **3 Claims**

1. An electrophotographic copying apparatus which comprises:

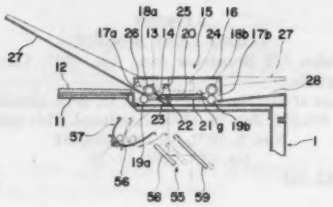
a transparent platform disposed at an upper portion of the apparatus for supporting thereon thick originals to be copied;

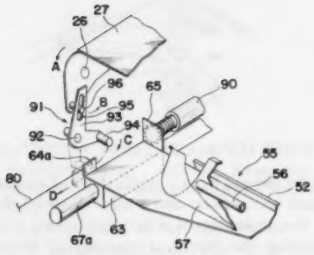
means for transporting sheet originals positioned adjacent said transparent platform and having sheet original transportation rollers;

an optical system for image formation having at least an illuminating light source for illuminating the original, first and second reflecting mirror means for projecting the image of the original onto a moving photosensitive member, moving means connected to said light source and said mirror means for (1) moving said light source and said first mirror means and said second mirror means beneath said transparent platform at a first speed or a second speed, said speeds being in a speed ratio of 2 to 1 to scan said transparent platform for copying a thick original and (2) for moving said light source and said first and second mirror means to a scanning starting position with said mirror means closest to each other beneath said sheet original transporting means and discontinuing movement thereof when said apparatus is to copy a sheet original;

changeover means associated with said apparatus for changing over the operation thereof from copying thick originals to copying sheet originals; and

shifting means connected to said changeover means and to said moving means (1) for moving said light source and said mirrors from said scanning starting position under said means for transporting sheet originals and (2) for





shifting said first mirror means away from said second mirror means so as to make the distance between said first and second mirror means in the stationary position greater than the distance therebetween in the scanning starting position upon the operation of said changeover means.

4,174,905

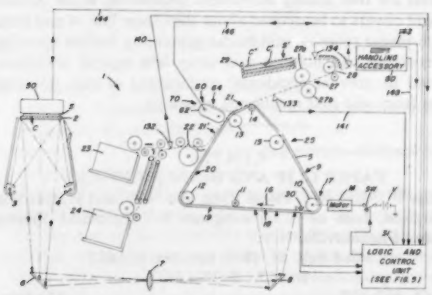
METHOD AND APPARATUS FOR PRODUCING DUPLEX COPIES

Alphonse B. DiFrancesco, Penfield, and Charles T. Hage, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 768,665, Feb. 14, 1977, Pat. No. 4,095,979. This application Mar. 10, 1978, Ser. No. 885,146

Int. Cl.[2] G03G *15/00*; G03B *27/32*

U.S. Cl. 355—14 R **18 Claims**



1. Apparatus for producing first and second images on first and second sides respectively of a copy sheet before producing images on a successive copy sheet, comprising:

a movable image transfer member;

means for forming first and second sequential adjacent transferable unfixed images on said image transfer member; and

means located in transfer relation with said transfer member for transferring said first and second sequential adjacent transferable unfixed images directly from said image transfer member to first and second sides respectively of a copy sheet brought into transfer relation with said transfer member before fixing of either of said unfixed images to said copy sheet and before transferring images to a successive copy sheet.

4,174,906

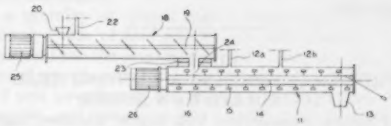
PROCESS AND APPARATUS FOR THE CONTINUOUS PREPARATION OF A MIXTURE FOR FOUNDRY MOLDS OR THE LIKE, WITH FORMATION OF A PREMIX

Gerard Y. Richard, Precy-sur-Oise, France, assignor to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.-.I.C., Asnieres, France

Division of Ser. No. 662,806, Mar. 1, 1976, Pat. No. 4,056,259. This application Aug. 1, 1977, Ser. No. 820,568

Int. Cl.[2] B28C *5/14*

U.S. Cl. 366—6 **11 Claims**



1. A method of continuously preparing a mixture of materials comprising a granular and/or pulverulent charge which is agglomerated by a binder-hardener system, comprising; forming an intimate and homogeneous pre-mix by malaxating the charge and only one of the two constituents of the binder-hardener system; then introducing into a thin film malaxating apparatus the second constituent of the binder-hardener system so as to bring this second constituent into contact with the pre-mix, malaxating the entire final mixture of the pre-mix and the second constituent in the form of a thin film formed on the malaxating surface of said apparatus by centrifugal forces imparted to said mixture in said apparatus, for a few seconds, and finally discharging the final mixture immediately to its point of use.

4,174,907

FLUID MIXING APPARATUS

Nam P. Suh, Sudbury; Christopher A. Rotz, Watertown; Lewis Erwin, II, Belmont; James R. Melcher, Lexington, all of Mass., and James F. Hoburg, Allison Park, Pa., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 760,170, Jan. 17, 1977, abandoned, which is a continuation of Ser. No. 584,984, Jun. 9, 1975, abandoned. This application Sep. 1, 1978, Ser. No. 938,817

Int. Cl.[2] B01F *7/24, 7/28*

U.S. Cl. 366—279 **25 Claims**

1. An apparatus for mixing at least two liquids having different electrical conductivities comprising

means forming a mixing region;

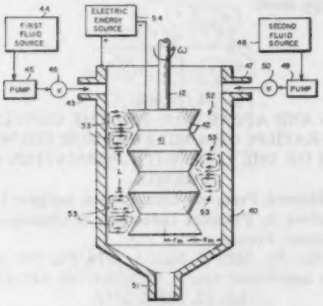
means for introducing said at least two liquids into said mixing region so as to form an interface region therebetween;

means for providing relative motions of said liquids in said mixing region;

means for producing an electrical signal;

means responsive to said electrical signal producing means for applying said electrical signal across said mixing region to interact with said different electrical conductivities so as to prevent said interface region from becoming aligned with the velocity streamlines of said liquids, said

liquids thereby being thoroughly mixed in a substantially laminar fashion in said mixing regions; and



means for removing the mixture of said liquids from said apparatus.

4,174,908

PRINTER COMPRISING A PRINTING HEAD CONTROLLED BY A SENSOR

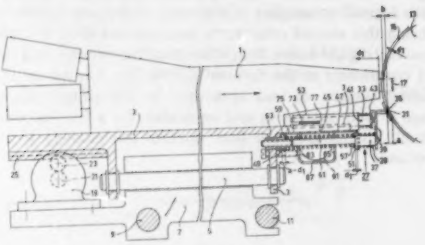
Herbert Wehler, Neunkirchen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1977, Ser. No. 851,891

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651884

Int. Cl.[2] B41J *3/12, 11/20*

U.S. Cl. 400—56 **7 Claims**



1. A printer which comprises:

a carriage which is displaceable in the printing direction along an associated record carrier,

a printing head carried on said carriage for sliding movement in a direction transverse to the printing direction independently of any carriage movement,

a sensor which is displaced in sychronism with said carriage and which is biased against the associated record carrier, said sensor serving to determine the thickness of the associated record carrier and being coupled to said printing head in order to maintain a constant, predetermined distance between said printing head and the associated record carrier, said sensor comprising a mechanical/electrical converter having an output signal which is proportional to the thickness of the associated record carrier, said sensor comprising a first follower which is biased against the associated record carrier and which is relatively displaceable with respect to said carriage, and a second follower which is biased against the associated record carrier and which is relatively displaceable with respect to said first follower, a mechanical part of said mechanical-/electrical converter being coupled to said first follower and an electrical part of said converter being coupled to said second follower, and

an electric motor connected to said converter to receive said output signal and a mechanical drive for said printing head cooperating with said printing head to displace said printing head relative to said carriage a distance which is equal to the sensed thickness of said record carrier.

4,174,909

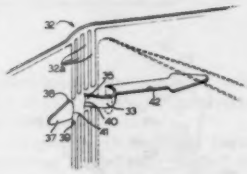
LOOSE LEAF BINDER

Gerhard Jahn, 655 Broadview Ave., Apt. 1907, Toronto, Ontario, Canada

Continuation of Ser. No. 677,297, Apr. 15, 1976, abandoned, and Ser. No. 490,093, Jul. 19, 1973, abandoned. This application Nov. 9, 1977, Ser. No. 850,051

Int. Cl.[2] A47L *13/26*

U.S. Cl. 402—13 **3 Claims**



1. A binder formed from a single sheet of material comprising front and back covers and a spine disposed therebetween and about the center line of which said covers swing in opening and closing the binder, a plurality of fastening means formed integrally from one of said covers and each comprising a thin narrow bendable strap of substantially uniform width throughout its length and having its root located adjacent to said spine and extending transversely away from said spine center line and terminating in an enlarged tab, a plurality of openings disposed in said spine adjacent to the center line thereof and having at least a portion thereof clear of that portion of the spine which lies between said center line and the other of said covers, whereby swinging movement of said other cover about said spine center line does not alter the distance between the roots of said straps and said opening portions, said openings being in aligned relation with said fastening means and being adapted to accept the passage of the tabs of said fastening means therethrough with a substantial portion of said fastening means constituted by said straps forming loops extending between said strap roots and said opening portions to accommodate a plurality of sheets of loose leaf material for free sliding movement therealong while permitting said covers to be opened about the center line of said spine into co-planar relation, said binder presenting further openings for receiving and holding said strap tabs against accidental removal to prevent accidental withdrawal of said fastening means from said first mentioned openings.

4,174,910

PAPER CLIP AND BINDER DEVICE

Thomas W. McSherry, Floral Park, and Nathaniel H. Garfield, Harrison, both of N.Y., assignors to Mechanical Plastics Corp., Pleasantville, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,052

Int. Cl.[2] B42F *13/02*

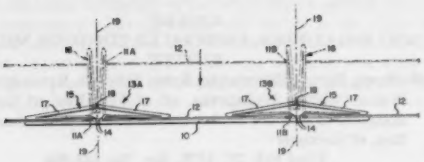
U.S. Cl. 402—19 **17 Claims**

1. A sheet binding device for fastening to one or more sheets having spaced-apart openings comprising:

an elongated backing member extending between such spaced-apart openings; and

attached to said backing member at spaced-apart positions corresponding to the spacing between such openings, a plurality of fastening elements, each comprising a connecting portion for insertion into such openings, and at the end of said connecting portion remote from said backing member, locking means movable between a collapsed

position in which the fastening element is insertable into such opening and an expanded over-center locking position in which said locking means is effective to preclude removal of said fastening element.

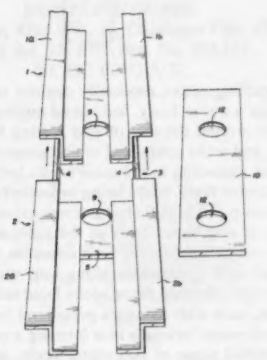


4,174,911

STRUCTURAL STEEL CLAMPED JOINT

Floriano A. Maccario, 12233 - 135 St., Edmonton, Alberta, Canada (T5L 1W9), and Tommaso Affinita, Corso Liberta 3, 46100 Mantova, Italy

Filed Oct. 10, 1978, Ser. No. 949,789
Claims priority, application Canada, Jun. 30, 1978, 306589
Int. Cl.[2] B25G *3/00*; F16B *7/04*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—303 1 Claim



1. A joint for structural steel comprising:

a first pair of parallel beams having a cross-sectional form with an L-shaped component;

a second pair of parallel beams having a cross-sectional form with an L-shaped component;

a U-shaped channel having two upstanding side walls and a bottom wall connecting the side walls, the bottom wall having one or more centrally located holes therethrough;

said first and second pairs of parallel beams nesting within the U-shaped channel in end-to- end relationship without obstructing the holes of the bottom wall of the U-shaped channel;

a clamping plate fitting into the U-shaped channel over the beams and having one or more holes aligning with the holes in the bottom wall of the U-shaped channel; and

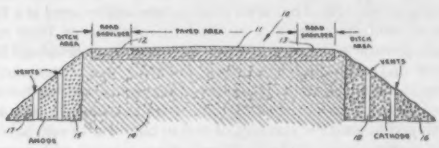
means for binding the clamping plate and the U-shaped channel together, said clamping plate forcing the beams outwardly against the side walls of the U-shaped channel and downwardly against the bottom wall of the U-shaped channel.

4,174,912

SYSTEM FOR HEAVE REDUCTION IN HIGHWAYS DUE TO FROST OR MOISTURE IN EXPANSIVE CLAY OR SHALE MATERIALS

Earl C. Peterson, Minneapolis, Minn., assignor to Electroosmosis Inc., Minneapolis, Minn.

Filed Jul. 31, 1978, Ser. No. 929,428
Int. Cl.[2] E01C *3/06*
U.S. Cl. 404—27 4 Claims



1. In combination with a roadbed having a centrally disposed paved zone flanked by lateral shoulder zones, electrolytic means for the control of moisture migration through the soil and comprising:

(a) a plurality of spaced anode means disposed laterally along a side of said paved zone and generally equally spaced from the central axis of said roadbed, and a plurality of spaced cathode means disposed laterally along a side of said paved zone and electrolytically coupled to said anodes, and being generally equally spaced from the axis of said roadbed;

(b) said anode means comprising a plurality of columns of particles of a stone having a relatively high calcium and magnesium oxide content, and being disposed in trenches formed along said roadbed; and

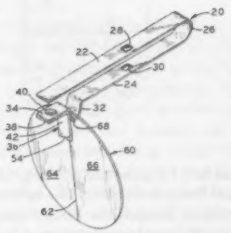
(c) said cathode means comprising a quantity of coke particles disposed in trenches formed along said roadbed.

4,174,913

ANIMAL GUARD FOR FIELD PIPE

Carroll G. Schliesser, Hicksville, Ohio, assignor to Myrtle M. Schliesser, Hicksville, Ohio

Filed Nov. 17, 1977, Ser. No. 852,518
Int. Cl.[2] E02B *7/20*
U.S. Cl. 405—94 2 Claims



1. In an animal guard for an elongated field pipe having a generally U-shaped member with elongated inner and outer legs each having a longitudinal axis connected by a bight portion and proportioned to be positioned over an open end of said pipe with said inner and outer legs extending axially of the pipe and respectively engaging the inner and outer surfaces thereof respectively; a generally circular baffle member formed of relatively thin sheet material pivotally suspended adjacent an upper perimetral portion thereof on said inner leg at a pivotal point thereon spaced a predetermined axial distance from said bight portion; said baffle member being vertically suspended from said point for pivotal movement in a first arcuate direction toward said inner leg and bight portion; an indented portion in said inner leg at said pivotal point; said baffle member having an oblong slot for receiving said in-

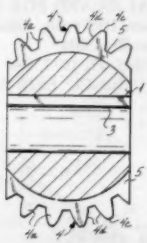
dented portion to provide free pivotal movement between said inner leg and said member; the diameter of said baffle member being less than said predetermined distance; said baffle member being folded along a substantially vertical diameter to form a member half on either side of said diameter and having an obtuse fold angle between the member halves, said halves being inclined from said diameter in a direction away from said bight portion, the improvement comprising a stop member for preventing pivotal movement of said baffle member in the direction opposite said first direction; said stop member comprising an elongated bar with four corners and secured at a first end to said inner leg at a position thereon spaced from said bight portion a distance greater than said predetermined distance and extending lengthwise inwardly and downwardly from the axis of said inner leg; the other end of said bar having the inner corner portions thereof of folded construction and arranged to abut the surfaces of and to conform to said halves, said portions providing stabilizing surface contact with respective halves of said member when said member is pivoted in said opposite direction; said bar having a length to provide a stop for the pivotal movement of said baffle member in an arcuate direction opposite to said first arcuate direction thus preventing animal entry into said pipe past said member from said open pipe end, whereby said member is freely pivotable in said first direction to provide substantially free-flow of debris carrying effluents when mounted in said pipe towards said open pipe end; the length of said bar being less than one-half of the diameter of said baffle member.

4,174,914

SPHERICAL HOB FOR GENERATING GEARS

Masato Ainoura, 1253 Eguchi, Kita-Shigeyasu-cho, Miyaki-gun, Saga-ken, Japan

Filed Jun. 19, 1978, Ser. No. 916,689
Claims priority, application Japan, Jun. 22, 1977, 52-74142
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—26 **2 Claims**



1. A spherical hob for generation of a gear, which comprises a frustospherical body in the form of a sphere truncated at two opposed extremities thereof, the body having an axis of symmetry perpendicular to said extremities, a hole passing through said body coaxially with said axis, formed spirally about said axis on the peripheral surface of the body projections having a section in a plane including said axis in the form of an involute tooth profile, formed on the peripheral surface of the body, across said projections a plurality of equidistantly arranged spaces dividing said projections into a plurality of spirally continuous hob blades, each having an involute tooth profile, and reliefs formed on the side faces and peripheral face of the hob blades so that as the blade faces of the hob blades are cut and sharpened, the tooth profile of an imaginary gear generated by rotation of the hob about said axis is gradually displaced to attain an addendum to the tooth profile, whereby after cutting and sharpening of the hob blade faces after said faces have become dull from use in cutting gears in gear glanks, shifting of the hob toward a new gear blank by a distance corresponding to the magnitude of undercut of the peripheral relief results in cutting in the new gear blank of a gear generated in gear blanks before cutting and sharpening of the blade faces.

4,174,915

MILLING CUTTER, ESPECIALLY CONTOUR MILLING CUTTER

Wolfgang Peetz, Blitzenreute; Anton Scheuch, Ravensburg, and Walter Müller, Weingarten, all of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,506
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 7705745[U]
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—59 **10 Claims**

1. A milling cutter, especially contour milling cutter, which comprises a cutter body, individual cutting elements helically arranged around the axis of said cutting body and connected thereto, and webs connected to and projecting from the cutter body and extending in the same sense, helically about the axis of said cutter body while being separated from each other by chip grooves, all of said chip grooves extending helically about the axis of said cutter body in the same sense, and said webs having web edges located on a common cylinder mantle and provided with depressions along said web edges while web sections between said depressions from said individual cutting elements, each web having a peripheral land and each of said cutting elements having a face forming a relatively small angle with a radial plane of said cutter body, and adjoining one of said peripheral lands, said peripheral lands being located on said common cylinder mantle, said face and the pertaining circular land enclosing an acute angle with each other, the height of said depressions at a maximum amounting to half the depth of said chip grooves, the spacing between said depressions along said web amounting at a maximum to about 1 mm, the width of the cutting elements measured along the pertaining cutter element amounting to about ⅓ of the distance between said depressions.

4,174,916

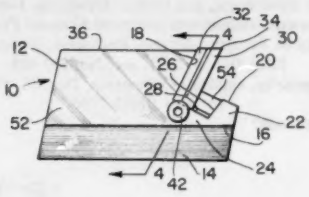
FORMING TOOL CONSTRUCTION

Mitchell Kezran, Cranston, R.I., assignor to Precision Industries, Inc., Providence, R.I.

Filed Apr. 24, 1978, Ser. No. 899,888
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—108 **13 Claims**

1. A dove-tailed forming tool adapted for receipt in a dove-tailed holder of a machine for plunge forming of a workpiece comprising, a block including front, top and bottom faces, said block having an integral dove-tail extending along the bottom

face thereof for releasable engagement in a dove-tailed slot of a holder, said block including a generally vertically oriented front face and an integral front support overlying said dove-tail and extending forwardly of said front face, a laterally extending open top slot having a base wall formed in the upper surface of said support and disposed rearwardly of the forward extent of said support so as to dispose said base wall adjacent said front face and an upstanding slot wall adjacent said base wall and disposed in opposed relation to said front face, a



forming insert having a top working surface, a bottom surface, and rear and front surfaces, said insert disposed in said slot with said insert bottom surface supported by said slot base wall and said insert rear surface disposed against said block front face, at least one insert wedge disposed in said slot and adapted to mutually contact said upstanding slot wall and the face surface of said insert so as to securely clamp said insert to said block and positioning means for fixing the position of said insert within said slot with respect to said block.

4,174,917

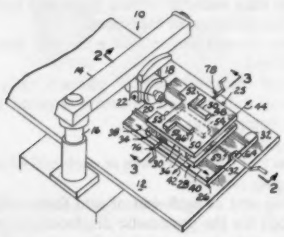
DOWELING GUIDE

Conrad J. Brower, 4313 NW. 14, Oklahoma City, Okla. 73107

Filed Jul. 13, 1978, Ser. No. 924,123

Int. Cl.[2] B23Q *5/22*

U.S. Cl. 408—62 **3 Claims**



1. A doweling guide in combination with a radial arm saw having an arm portion projecting horizontally in vertically spaced transverse relation across a work platform intermediate its ends and having a drill bit operatively attached to the radial arm saw motor and projecting horizontally in parallel spaced relation toward one end of the platform, the improvement comprising:

an elongated base plate flatly overlying said platform and having a forward end portion underlying the position of said drill bit;

an intermediate plate overlying said base plate in longitudinally aligned vertically spaced parallel relation;

a top plate overlying said intermediate plate in vertically spaced parallel relation;

top plate support and control means interposed between and secured to said top plate and said intermediate plate for movement of said top plate transversely of said intermediate plate;

intermediate plate support and control means interposed between and secured to said intermediate plate and said base plate for movement of said intermediate plate and said top plate as a unit longitudinally of said base plate toward and away from said drill bit; and,

guideways overlying and secured to said top plate for alignably positioning a workpiece with the axis of said drill bit.

4,174,918

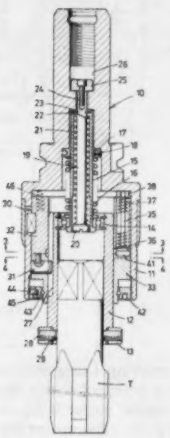
TAP HOLDER

Yukio Tanaka, Takarazuka, Japan, assignor to Showa Machine Industries Co., Ltd., Japan

Filed Apr. 18, 1978, Ser. No. 897,644

Int. Cl.[2] B23B *31/38;* **B23G** *3/00*

U.S. Cl. 408—139 **7 Claims**



1. A tap holder comprising:

an elongated holder body having a first end and a second end, said first end having therein an axial bore for connection to a spindle for rotation of said holder body, and said second end having extending therefrom an axially extending cylindrical housing;

a tap-supporting collet mounted for axial sliding movement within said housing;

clutch means positioned within said housing for transferring rotation of said holder body to said collet and for interrupting transfer of said rotation when the rotation torque exceeds a predetermined maximum, said clutch means comprising a first cylindrical member positioned within said housing between said housing and said collet, said first cylindrical member being rotatively fixed with respect to said housing and freely rotatable with respect to said collet, a second cylindrical member positioned within said housing, axially of said first cylindrical member, between said housing and said collet, said second cylindrical member being freely rotatable with respect to said housing and rotatively fixed with respect to said collet, said second cylindrical member having an end adjacent said first cylindrical member, said end having therein a plurality of radially extending grooves, a plurality of rollers retained within said first cylindrical member and partially fitting into said grooves, and pressing means within said first cylindrical member for urging said rollers into said grooves; and

means for axially resiliently connecting said collet to said holder body, said connecting means including first spring means for urging said collet axially away from said first end of said holder body, second spring means for urging said collet axially toward said first end of said holder body, and means for adjusting the urging force of said first spring means.

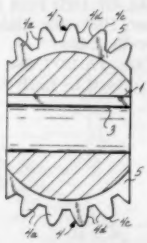
dented portion to provide free pivotal movement between said inner leg and said member; the diameter of said baffle member being less than said predetermined distance; said baffle member being folded along a substantially vertical diameter to form a member half on either side of said diameter and having an obtuse fold angle between the member halves, said halves being inclined from said diameter in a direction away from said bight portion, the improvement comprising a stop member for preventing pivotal movement of said baffle member in the direction opposite said first direction; said stop member comprising an elongated bar with four corners and secured at a first end to said inner leg at a position thereon spaced from said bight portion a distance greater than said predetermined distance and extending lengthwise inwardly and downwardly from the axis of said inner leg; the other end of said bar having the inner corner portions thereof of folded construction and arranged to abut the surfaces of and to conform to said halves, said portions providing stabilizing surface contact with respective halves of said member when said member is pivoted in said opposite direction; said bar having a length to provide a stop for the pivotal movement of said baffle member in an arcuate direction opposite to said first arcuate direction thus preventing animal entry into said pipe past said member from said open pipe end, whereby said member is freely pivotable in said first direction to provide substantially free-flow of debris carrying effluents when mounted in said pipe towards said open pipe end; the length of said bar being less than one-half of the diameter of said baffle member.

4,174,914

SPHERICAL HOB FOR GENERATING GEARS

Masato Ainoura, 1253 Eguchi, Kita-Shigeyasu-cho, Miyaki-gun, Saga-ken, Japan

Filed Jun. 19, 1978, Ser. No. 916,689
Claims priority, application Japan, Jun. 22, 1977, 52-74142
Int. Cl.[2] B26D 1/12
U.S. Cl. 407—26 **2 Claims**



1. A spherical hob for generation of a gear, which comprises a frustospherical body in the form of a sphere truncated at two opposed extremities thereof, the body having an axis of symmetry perpendicular to said extremities, a hole passing through said body coaxially with said axis, formed spirally about said axis on the peripheral surface of the body projections having a section in a plane including said axis in the form of an involute tooth profile, formed on the peripheral surface of the body, across said projections a plurality of equidistantly arranged spaces dividing said projections into a plurality of spirally continuous hob blades, each having an involute tooth profile, and reliefs formed on the side faces and peripheral face of the hob blades so that as the blade faces of the hob blades are cut and sharpened, the tooth profile of an imaginary gear generated by rotation of the hob about said axis is gradually displaced to attain an addendum to the tooth profile, whereby after cutting and sharpening of the hob blade faces after said faces have become dull from use in cutting gears in gear glanks, shifting of the hob toward a new gear blank by a distance corresponding to the magnitude of undercut of the peripheral relief results in cutting in the new gear blank of a gear generated in gear blanks before cutting and sharpening of the blade faces.

4,174,915

MILLING CUTTER, ESPECIALLY CONTOUR MILLING CUTTER

Wolfgang Peetz, Blitzenreute; Anton Scheuch, Ravensburg, and Walter Müller, Weingarten, all of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,506
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 7705745[U]
Int. Cl.[2] B26D 1/12
U.S. Cl. 407—59 **10 Claims**

1. A milling cutter, especially contour milling cutter, which comprises a cutter body, individual cutting elements helically arranged around the axis of said cutting body and connected thereto, and webs connected to and projecting from the cutter body and extending in the same sense, helically about the axis of said cutter body while being separated from each other by chip grooves, all of said chip grooves extending helically about the axis of said cutter body in the same sense, and said webs having web edges located on a common cylinder mantle and provided with depressions along said web edges while web sections between said depressions from said individual cutting elements, each web having a peripheral land and each of said cutting elements having a face forming a relatively small angle with a radial plane of said cutter body, and adjoining one of said peripheral lands, said peripheral lands being located on said common cylinder mantle, said face and the pertaining circular land enclosing an acute angle with each other, the height of said depressions at a maximum amounting to half the depth of said chip grooves, the spacing between said depressions along said web amounting at a maximum to about 1 mm, the width of the cutting elements measured along the pertaining cutter element amounting to about $\frac{2}{3}$ of the distance between said depressions.

4,174,916

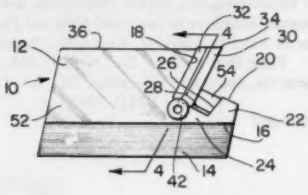
FORMING TOOL CONSTRUCTION

Mitchell Kezran, Cranston, R.I., assignor to Precision Industries, Inc., Providence, R.I.

Filed Apr. 24, 1978, Ser. No. 899,888
Int. Cl.[2] B26D 1/12
U.S. Cl. 407—108 **13 Claims**

1. A dove-tailed forming tool adapted for receipt in a dove-tailed holder of a machine for plunge forming of a workpiece comprising, a block including front, top and bottom faces, said block having an integral dove-tail extending along the bottom

face thereof for releasable engagement in a dove-tailed slot of a holder, said block including a generally vertically oriented front face and an integral front support overlying said dove-tail and extending forwardly of said front face, a laterally extending open top slot having a base wall formed in the upper surface of said support and disposed rearwardly of the forward extent of said support so as to dispose said base wall adjacent said front face and an upstanding slot wall adjacent said base wall and disposed in opposed relation to said front face, a



forming insert having a top working surface, a bottom surface, and rear and front surfaces, said insert disposed in said slot with said insert bottom surface supported by said slot base wall and said insert rear surface disposed against said block front face, at least one insert wedge disposed in said slot and adapted to mutually contact said upstanding slot wall and the face surface of said insert so as to securely clamp said insert to said block and positioning means for fixing the position of said insert within said slot with respect to said block.

4,174,917

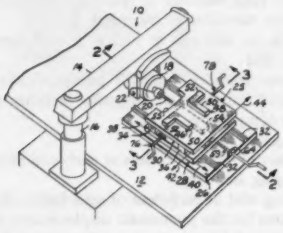
DOWELING GUIDE

Conrad J. Brower, 4313 NW. 14, Oklahoma City, Okla. 73107

Filed Jul. 13, 1978, Ser. No. 924,123

Int. Cl.[2] B23Q *5/22*

U.S. Cl. 408—62 **3 Claims**



1. A doweling guide in combination with a radial arm saw having an arm portion projecting horizontally in vertically spaced transverse relation across a work platform intermediate its ends and having a drill bit operatively attached to the radial arm saw motor and projecting horizontally in parallel spaced relation toward one end of the platform, the improvement comprising:

an elongated base plate flatly overlying said platform and having a forward end portion underlying the position of said drill bit;

an intermediate plate overlying said base plate in longitudinally aligned vertically spaced parallel relation;

a top plate overlying said intermediate plate in vertically spaced parallel relation;

top plate support and control means interposed between and secured to said top plate and said intermediate plate for movement of said top plate transversely of said intermediate plate;

intermediate plate support and control means interposed between and secured to said intermediate plate and said base plate for movement of said intermediate plate and said top plate as a unit longitudinally of said base plate toward and away from said drill bit; and,

guideways overlying and secured to said top plate for alignably positioning a workpiece with the axis of said drill bit.

4,174,918

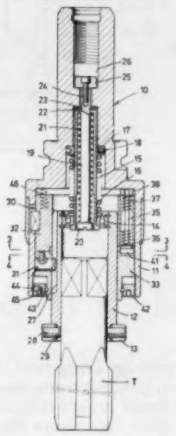
TAP HOLDER

Yukio Tanaka, Takarazuka, Japan, assignor to Showa Machine Industries Co., Ltd., Japan

Filed Apr. 18, 1978, Ser. No. 897,644

Int. Cl.[2] B23B *31/38*; B23G *3/00*

U.S. Cl. 408—139 **7 Claims**



1. A tap holder comprising:

an elongated holder body having a first end and a second end, said first end having therein an axial bore for connection to a spindle for rotation of said holder body, and said second end having extending therefrom an axially extending cylindrical housing;

a tap-supporting collet mounted for axial sliding movement within said housing;

clutch means positioned within said housing for transferring rotation of said holder body to said collet and for interrupting transfer of said rotation when the rotation torque exceeds a predetermined maximum, said clutch means comprising a first cylindrical member positioned within said housing between said housing and said collet, said first cylindrical member being rotatively fixed with respect to said housing and freely rotatable with respect to said collet, a second cylindrical member positioned within said housing, axially of said first cylindrical member, between said housing and said collet, said second cylindrical member being freely rotatable with respect to said housing and rotatively fixed with respect to said collet, said second cylindrical member having an end adjacent said first cylindrical member, said end having therein a plurality of radially extending grooves, a plurality of rollers retained within said first cylindrical member and partially fitting into said grooves, and pressing means within said first cylindrical member for urging said rollers into said grooves; and

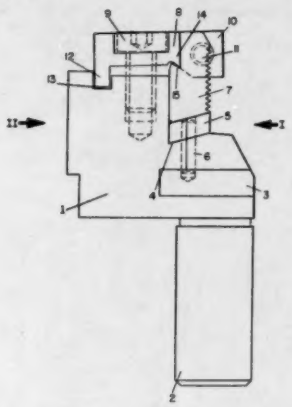
means for axially resiliently connecting said collet to said holder body, said connecting means including first spring means for urging said collet axially away from said first end of said holder body, second spring means for urging said collet axially toward said first end of said holder body, and means for adjusting the urging force of said first spring means.

4,174,919

HOLDER FOR A TANGENTIAL CHASING TOOL

Ingolf Knopp, Tuebingen, Fed. Rep. of Germany, assignor to Gustav Wagner Maschinenfabrik, Reutlingen, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,665
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727498
Int. Cl.[2] B23B *51/00*
U.S. Cl. 408—151 5 Claims



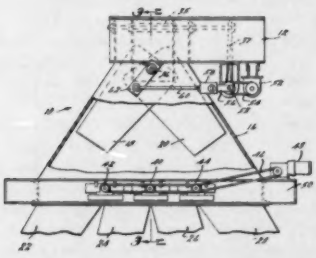
1. A holder for securing a tangential chasing tool including a dovetail portion in a thread cutter head, comprising chaser seat means in said thread cutter head, clamping plate means including guide claw means for securing said chasing tool in said thread cutter head, said clamping plate means comprising clamping jaw means and clamping screw means for securing said dovetail portion of said chasing tool, exchangeable, wedge shaped intermediate disk means having different wedging angles and insertable into said chaser seat, said guide claw means of said clamping plate means having a bottom edge forming a convex arc.

4,174,920

SOLID FUEL DISTRIBUTOR

Harold L. Knox, Grosse Ile, Mich., assignor to Detroit Stoker Company, Monroe, Mich.

Filed Apr. 19, 1978, Ser. No. 897,578
Int. Cl.[2] F23K *3/18;* B65G *11/12*
U.S. Cl. 414—160 8 Claims



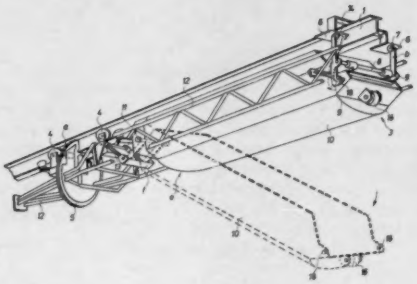
1. In a fuel distribution system for supplying fuel to a furnace through a multiplicity of supply chutes: a reciprocating spout assembly for distribution fuel into each of said supply chutes comprising a first reciprocating spout pivotally mounted on a horizontal axis and adapted to swing back and forth through an arcuate path to distribute fuel is succession into each of said supply chutes, a second reciprocating spout pivotally mounted on a horizontal axis and adapted to swing back and forth through an arcuate path to distribute fuel in succession into each of said supply chutes, and motive means connected to said first and second spouts for causing said spouts to reciprocate in opposed relation to one another.

4,174,921

PROCESS AND PLANT FOR THE CONTINUOUS UNLOADING OF THE HEAVY-DUTY CONTAINERS IN A PNEUMATIC TRANSPORT SYSTEM

Constantin Teodorescu, and Stefan Ardeleanu, both of Bucharest, Romania, assignors to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst, Bucharest, Romania

Filed Dec. 5, 1977, Ser. No. 857,669
Claims priority, application Romania, Dec. 25, 1976, 88839
Int. Cl.[2] B61D *7/04*
U.S. Cl. 414—387 6 Claims



1. A pneumatic transport system comprising:
a transport path defined by spaced tube sections traversed by a continuous overhead rail;
a surface provided below said rail at an unloading zone between tube sections of said path and approaching the rail in the direction of transport;
cam means on said rail in said zone and upstream of said surface; and
at least one transport vehicle pneumatically displaceable along said rail through said tube sections, said transport vehicle comprising:
an elongated frame,
a plurality of support rollers at each end of said frame and engaging said rail,
a packing seal at each end of said frame effective in said sections for the pneumatic displacement of the vehicle,
an elongated container pivotally mounted at one of its ends on said frame,
latch means on said frame and engaging the other end of said container for holding said container in a load-carrying position generally parallel to said rail, said latch means being engageable by said cam means when said vehicle is displaced along said rail for releasing said container to enable the pivoting thereof by gravity into a downwardly sloping unloading position, and
a wheel provided at said other end of said container riding along said surface when said container is in the unloading position for pivoting said container upwardly toward the load-carrying position.

4,174,922

UNLOADING DEVICE

Alvin B. Kennedy, Jr., 410 World Loop, Angleton, Tex. 77515

Division of Ser. No. 743,763, Nov. 22, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 878,693
Int. Cl.[2] B65G *65/24*
U.S. Cl. 414—786 3 Claims

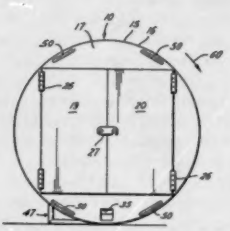
1. A method of simultaneously unloading a plurality of

barrels containing dry particulate matter, including the steps of:

(a) placing the plurality of barrels on a pallet;

(b) placing the pallet in a rack frame mounted in a cylindrical enclosure;

(c) closing the cylindrical enclosure;



(d) rotating the cylindrical enclosure about its longitudinal axis to thereby dump the dry particulate matter in the enclosure;

(e) tilting one end of the enclosure by lifting it upwardly;

(f) removing the dry particulate matter from the enclosure.

4,174,923

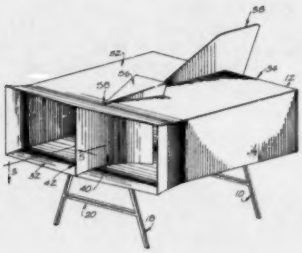
WIND DRIVEN ENGINE

Glen A. Williamson, Wagner, County of Phillips, Mont. 59543

Filed May 19, 1977, Ser. No. 798,294

Int. Cl.[2] F03D *3/02*

U.S. Cl. 415—2 **2 Claims**



1. In a wind driven engine having:

(a) a base;

(b) a housing rotatably mounted on said base, said housing including a front inlet opening, a rear outlet opening, and at least two sides;

(c) a first and second vertical rotor rotatably mounted in said housing and having a plurality of overlapping blades;

(d) a wedge-shaped air diverter approximately centrally mounted inside said housing and forward of said first and second vertical rotors so that the flow of air which enters said housing is diverted onto the blades of said rotors which are adjacent the sides of said housing thereby rotating one of said rotors clockwise and the remaining rotor counterclockwise;

(e) a vent in said housing which is centrally located over said air diverter; and

(f) means for mechanically joining said clockwise rotating rotor and said counterclockwise rotating rotor to an energy receiving system; said joining means comprising:

(g) a first hollow shaft rotatably mounted on said base, said hollow shaft being mechanically joined to said first vertical rotor;

(h) a first gear means attached to an end of said hollow shaft;

(i) a second shaft rotatably mounted above and extending through said hollow shaft and first gear means, said second shaft being mechanically joined to said second vertical rotor;

(j) a second gear means attached to the end of said second shaft which extends through and is adjacent to said first gear means; and

(k) means for mechanically joining said first and second gear means;

the improvement comprising:

a wedge-shaped air shield which covers said air vent, the apex of said air shield is closed and projects forward toward said inlet opening, and the rear of said shield is open at a point upstream of said rotors.

4,174,924

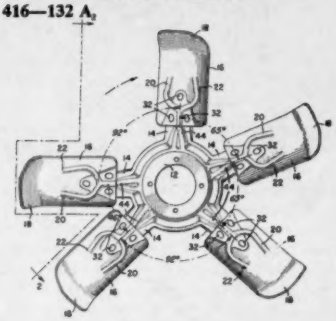
SHEET METAL FAN ASSEMBLY

Charles L. Smithson, Jr., Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 624,386, Oct. 21, 1975, abandoned. This application Aug. 16, 1977, Ser. No. 825,034

Int. Cl.[2] F04D *29/38*

U.S. Cl. 416—132 A **2 Claims**



1. A sheet metal fan assembly including a sheet metal hub having a plurality of radially extending spider arms each provided with a sheet metal fan blade, the improvement comprising, a radially extending rib on each arm thereof and extending outwardly from the surface of the arm, each blade provided at its radially inner portion with a rib extending radially along the blade and projecting outwardly from the surface of the blade, each blade being rigidly attached to an associated spider arm with the said rib on the blade and the said rib on the spider arm being in registered relationship, each blade being provided with a reinforcing channel intersecting with and branching laterally from either side of the radial outer end of said rib, the channel projecting outwardly from the surface of the blade in the same direction as said rib, said channel presenting a radially inner portion extending generally transverse to the longitudinal axis of the blade and arms at the ends of said inner portion which extend in a direction generally parallel with the longitudinal axis of the blade.

4,174,925

APPARATUS FOR EXCHANGING ENERGY BETWEEN HIGH AND LOW PRESSURE SYSTEMS

Dwight B. Pfenning, Oklahoma City; Lonnie C. Higginbottom, Midwest City, both of Okla., and Cedomir M. Sliepcevich, 2500 Butler Dr., Norman, Okla. 73069, assignors to Cedomir M. Sliepcevich, Norman, Okla.

Filed Jun. 24, 1977, Ser. No. 809,567

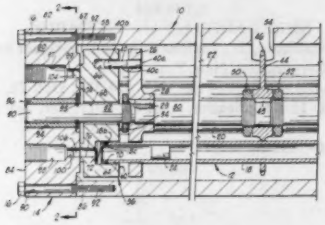
Int. Cl.[2] F04B *1/22*

U.S. Cl. 417—225 **24 Claims**

23. In an apparatus for elevating the pressure of a first liquid by means of a second liquid at a higher pressure, which apparatus includes (a) a plurality of elongated, mutually rotatable fluid pressure transfer passageways rotatable about a common,

centrally disposed axis, and (b) stationary, non-rotating means from and into which said passageways each alternately respectively receive and transfer liquid at alternately high and low pressures at at least two different locations at each of the opposite ends of each of the passageways, the improvement which comprises:

seal plates floatingly disposed at opposite ends of the several passageways and disposed between the passageway ends and said stationary non-rotating means, said seal plates each being sealingly engaged with, and surrounding, the end portions of each of the passageways and each being shiftable longitudinally of the passageways and to ran-



domly varying distances along the several passageways while continuing to surround the end portion of each of said passageways; and

means resiliently urging the seal plates into sealing engagement with said stationary non-rotating means,

said seal plates each further including openings through the respective seal plate to permit liquid movement between said passageways and said stationary, non-rotating means when each of said passageways rotates into a predetermined position relative to said stationary, non-rotating means, each of said seal plate openings slidably receiving an end portion of one of said passageways.

4,174,926

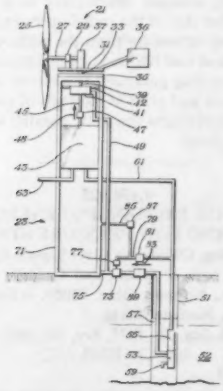
WINDMILL PUMP DRIVE SYSTEM

Joseph T. Hamrick, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to World Energy Systems, Fort Worth, Tex.

Continuation-in-part of Ser. No. 803,525, Jun. 6, 1977. This application Oct. 5, 1977, Ser. No. 839,419

Int. Cl.[2] F04B *17/02, 9/08*

U.S. Cl. 417—334 **6 Claims**



1. A system for pumping water from subsurface formations to the surface through a borehole, comprising:

pump means located in the borehole for pumping water in the borehole to the surface,

fluid driven power means located in the borehole for driving said pump means,

fluid storage means located at the surface,

second pump means located at the surface and coupled to said fluid storage means,

fluid accumulator means,

conduit means coupled from the outlet of said second pump means to said fluid accumulator means and to said fluid driven power means located in the borehole,

wind operated means located at the surface for operating said second pump means for pumping fluid from said fluid storage means through said conduit means to said fluid driven power means for operation thereof,

valve means coupled to said conduit means and adapted to be opened and closed for allowing fluid to flow through said conduit means to said fluid driven power means and for stopping the flow of fluid through said conduit means to said fluid driven power means respectively, and

control means responsive to the pressure of the water pumped by said pump means located in the borehole for closing said valve means when said pressure is below a certain level and for opening said valve means when said pressure is above said certain level,

said control means being responsive to the pressure in said fluid accumulator means for opening said valve means when the pressure in said fluid accumulator means rises above a predetermined level.

4,174,927

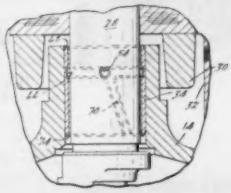
REFRIGERATION COMPRESSOR LUBRICATION

Ivan T. Lindstrom, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 787,379, Apr. 14, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,911

Int. Cl.[2] F04B *17/00, 35/00*

U.S. Cl. 417—372 **3 Claims**

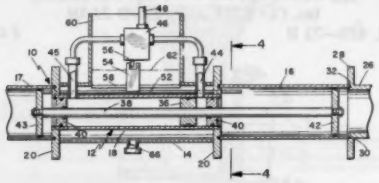


1. A refrigeration compressor comprising a housing, compressor means disposed within said housing, an oil sump containing lubricant, a vertical crankshaft drivingly connected to said compressor means, motor means for rotatably driving said crankshaft, bearing means including an upper bearing provided in said housing, said crankshaft being rotatably journaled in said bearing means, lubrication means in said crankshaft for supplying lubricant from said sump to said bearing means, and return means on said upper bearing for returning lubricant from said upper bearing to said sump via a path disposed between said uppeer bearing and said crankshaft, said return means including a continuous annular groove on the crankshaft engaging surface of said upper bearing, said annular groove being located closer to the upper end of said upper bearing than to the lower end thereof, said return means further including a pair of generally axially extending grooves provided on said crankshaft engaging surface of said upper bearing, said generally axial grooves being circumferentially spaced, spiralled, of opposite hand and extending only from said annular groove to the lower edge of said upper bearing whereby said return means is operative to prevent lubricant from entering said compressor means.

4,174,928
DOUBLE ACTING CONCRETE PUMP

Richard D. Austin, 3337 Hopi Pl., San Diego, Calif. 92117

Filed Mar. 13, 1978, Ser. No. 885,588
Int. Cl.[2] F04B *17/00, 15/02;* **F01L** *23/00*
U.S. Cl. 417—397 **5 Claims**

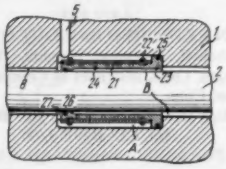


1. A double acting concrete pump, comprising:
an actuator having a reciprocating piston therein with a piston rod extending from opposite ends of the actuator;
a pair of mud cylinders mounted axially on opposite ends of said actuator, each having a mud piston therein secured to said piston rod;
said mud cylinders having outer ends with connector means thereon for connection to a source of fluid material to be pumped, and to a delivery outlet;
a lubricant containing reservoir including a jacket surrounding said actuator, with openings communicating with the inner ends of said mud cylinders by action of the mud pistons;
a source of power connected to said actuator;
and reversing means coupled to said source of power for reversing said reciprocating piston.

4,174,929
HIGH PRESSURE PUMP

Anatoly N. Grakov, ulitsa Zolotodolinskaya, 29, kv. 424; Oleg I. Grebennik, ulitsa Tereshkovoi, 6, kv. 172., both of Novosibirsk; Jury A. Dudin, ulitsa Parkhomenko, 106, kv. 10, Ufa; Vladimir L. Lutsker, ulitsa Lomonosova, 7/2, kv. 7, Murmansk; Valery N. Makarov, Morskoi prospekt, 5, kv. 43; Viktor M. Ogolikhin, ulitsa Akademicheskaya, 2[a], kv. 213, both of Novosibirsk, and Tatyana P. Khrustaleva, ulitsa Lyashenko, 6[a], kv. 1, Obninsk Kaluzhskoi Oblasti, all of U.S.S.R.

Filed Mar. 15, 1977, Ser. No. 777,845
Int. Cl.[2] F01M *1/00;* **F04B** *39/02;* **F16J** *18/56*
U.S. Cl. 417—437 **2 Claims**

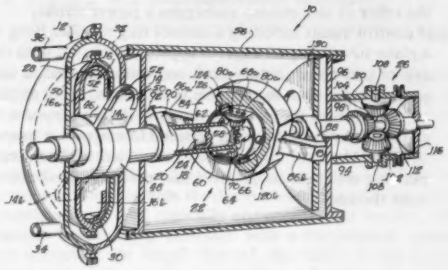


1. A high-pressure pump comprising: a housing; a movable piston mounted within said housing and defining a chamber; a movable partition member arranged within said housing, said partition member dividing said chamber into first and second spaces substantially insulated from each other and mounted coaxially with the piston; a working medium source; a low-pressure sealing medium source; a first non-return valve connecting the first space with said working medium source; a second non-return valve connecting said first space with a consumer; a third non-return valve connecting one side of the second space with said low-pressure sealing medium source; a slit seal comprising an annular space formed between the inner surface of said housing and the outer surface of said piston, said annular space connecting the other side of said second space with said low-pressure sealing medium source; a stop for limiting the displacement of said partition member during the intake stroke, said stop being arranged within said housing, rigidly connected thereto and mounted within said first space, said partition member comprising an elastic membrane, said stop comprising a bushing embracing said piston, said flexible membrane having edges fastened to said bushing, the outer surface of the bushing limiting the displacement of said membrane during the intake stroke, said bushing having open radial bores, the number of bores being selected to provide for minimum resistance offered to the working liquid.

4,174,930
ROTARY ENGINE

Chester A. Posson, 4651 Teonia Woods Rd., Rolling Meadows, Ill. 60008

Filed Nov. 21, 1977, Ser. No. 853,100
Int. Cl.[2] F02B *53/00*
U.S. Cl. 418—36 **8 Claims**



1. A rotary engine comprising:
housing means defining a substantially closed chamber,
fuel inlet, fuel ignition and exhaust means communicating with said chamber in predetermined registration therewith,
a pair of pistons supported within said chamber for rotation about a common axis, each of said pistons defining substantially diametrically opposed blade pistons extending outwardly from said common axis of rotation,
first support shaft means supporting one of said pistons within said chamber for rotation about said common axis of rotation,
second support shaft means rotatably supporting the other of said pistons within said chamber for rotation about said common axis of rotation and with its said opposed blade pistons being interposed between the blade pistons of said one of said pistons,
said pistons being rotatable relative to each other and relative to said chamber so as to establish variable volume chambers between successive blade pistons,
a power output shaft,
and motion translation mechanism means interconnecting said first and second support shaft means to said power output shaft and operative to effect unidirectional rotation of said output shaft during cyclical rotation of said pistons, said motion translation mechanism means including carrier ring means connected to said output shaft and to said pistons so that rotation of said pistons effects a corresponding rotation of said output shaft, and control means being connected to said output shaft and said carrier ring means and adapted to effect predetermined movement of said carrier ring means in response to rotation of said pistons so that, in continuous predetermined sequence, a first one of said pistons rotates about its rotational axis in a power stroke upon selective ignition of fuel within said chamber while the other of said pistons remains substantially stationary relative to said chamber, and thereafter

said first one of said pistons is maintained in substantially stationary relation to said chamber while the other of said pistons undergoes rotation during a power stroke upon further selective ignition of fuel within said chamber, whereafter said pairs of pistons are caused to undergo continued alternating rotational movement during power strokes so as to effect unidirectional rotation of said power output shaft,

each of said first and second shaft means carrying a gear segment in fixed relation thereon, said carrier ring means including a pair of gear segments each of which is adapted for driven relation with one of said gear segments on said first and second shaft means, said carrier ring means being connected to said power output shaft so that rotation of either one of said gear segments on said first and second shaft means effects a corresponding rotation of said power output shaft, said control means being connected with said carrier ring means and adapted to effect predetermined movement thereof so that one of said pistons is maintained in substantially stationary relation to said chamber when the other of said pistons undergoes a power stroke,

said control means including a control ring member lying in a plane subtending an angle of approximately 49° with the axis of said power output shaft and being coupled to said power output shaft in a manner to be rotated about an axis coincident with the axis of said output shaft in response to and in a rotational direction opposite to said power output shaft, said control ring member connected with said carrier ring means so as to effect said predetermined movement thereof.

4,174,931

VANE FOR ROTARY COMPRESSOR

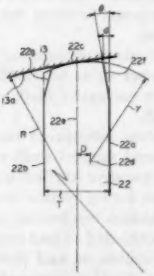
Yutaka Ishizuka, Konan, Japan, assignor to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Dec. 13, 1977, Ser. No. 860,400

Claims priority, application Japan, Dec. 17, 1976, 51-169994[U]

Int. Cl.[2] F04C *29/00*

U.S. Cl. 418—259 **10 Claims**



1. In a rotary vane compressor, a generally rectangular vane having a leading surface and trailing surface, a radially outer portion of the leading surface being cut away by a predetermined amount;

the radially outer portion of the leading surface being flat and making an angle θ with the leading surface;

the angle θ being between 3° and 15°.

4,174,932

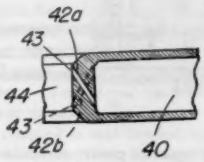
APPARATUS FOR EXTRUDING TUBULAR THERMOPLASTIC FILM

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 767,097, Feb. 9, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,476

Int. Cl.[2] B29F *3/08*; B29D *23/04*

U.S. Cl. 425—72 R **5 Claims**



1. In an apparatus for forming tubular thermoplastic film comprising extruder means; annular extrusion die means, adopted in combination to extrude a single tube of thermoplastic film; pinch rollers spaced downstream from said annular extrusion die adopted to flatten said tube; and means for introducing a fluid under pressure into said tube whereby to biaxially expand said tube and reduce the wall thickness thereof; the improvement which comprises a housing member assembly disposed concentric to said extruded tube downstream of, and adjacent to, said annular die, said tubular thermoplastic film passing through said housing member assembly upon exiting from said die, said assembly being further characterized by having multiple rows of channels therethrough, each of said channels terminating in an aperture on the inner surface of said housing, said apertures being arranged in a series of streamwisedly spaced pairs of diverging aperture row adjacent to and directed towards said extruded tubing in an overall diverging shape, said streamwisedly spaced pairs of aperture rows having individual apertures in one row of the pair which diverge from the adjacent apertures in the second row of the pair, means for forcing a fluid through said apertures towards said extruded tubing and then away from such tubing, whereby creating a suction and thus drawing said extruded tubing toward said assembly; an uppermost cooling housing superimposed above said assembly, said cooling housing comprising a continuous circular housing which surrounds said tube and which circular housing supplies cooling air under pressure to said tube, said air being outwardly and upwardly directed.

4,174,933

FORMING AN EXTRUDED BAR OUT OF METAL CHIPS

Robert D. Mitchell, Harwood Heights, Ill., and Albert C. Schulz, Hudson, Ohio, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 27, 1977, Ser. No. 864,413

Int. Cl.[2] B29F *3/06*

U.S. Cl. 425—79 **2 Claims**

1. Extruding apparatus for extruding metal particles into bar stock; including:

a bin for holding the metal particles;

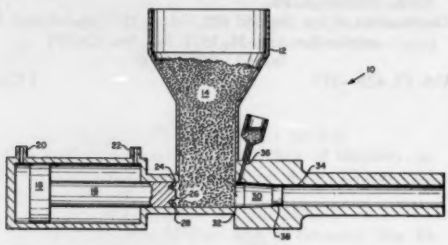
an extruding die having an inlet end opening into a lower portion of the bin, an outlet end through which the finished bar stock is discharged, and a passageway of reducing diameter connecting the inlet end with the outlet end, the inlet end being of a larger diameter than the outlet end;

a ram;

means operatively associated with the ram for reciprocating the ram back and forth through the lower portion of the bin, in alignment with the extruding die, an end surface of the ram which contacts the metal particles containing undulations therein;

means for distributing a lubricant into the extruding die around the periphery of the inlet end; and

a compressible material plug positioned at the inlet end of the extruding die at the start of the extruding operation,



said plug having a diameter smaller than the inlet end of the extruding die, but larger than the outlet end.

4,174,934

APPARATUS FOR THE PREPARATION OF HOLLOW PLASTIC ARTICLES

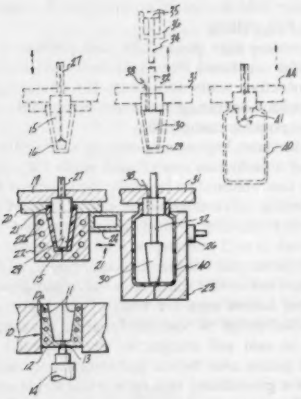
Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Division of Ser. No. 786,461, Apr. 11, 1971, which is a continuation-in-part of Ser. No. 618,782, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 473,580, May 24, 1974, Pat. No. 3,966,378. This application May 1, 1978, Ser. No. 901,849

The portion of the term of this patent subsequent to Jun. 29, 1995, has been disclaimed.

Int. Cl.[2] B29C *17/07*; B29D *3/00*

U.S. Cl. 425—112 **13 Claims**



1. An apparatus for forming multi-axially oriented objects of moldable organic plastic material which comprises: a first core and a temperature controlled first mold; means for providing a parison on said first core, means including said first core to place said parison in said first mold; means for separating said parison from said first core while retaining said parison in said first mold to adjust the temperature thereof for orientation conditions; a second core and a second mold; means for transferring said parison to said second core and said second mold; means for axially extending said parison in said second mold and means to expand said parison on said second core in said second mold to provide a finished article which is multi-axially oriented; means for separating said finished article from said second core while retaining said finished article in said second mold; and means to eject said finished article, wherein said molds are in spaced relationship to each other and move in a lateral direction relative to the parison axis and wherein said cores are in spaced relationship to each other and move in a direction parallel to the parison axis.

4,174,935

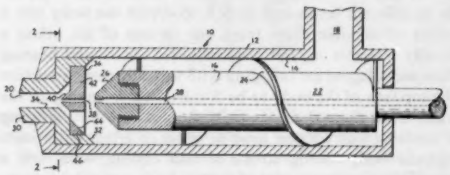
EXTRUSION APPARATUS FOR PRODUCING ELONGATED CORE MEMBERS COVERED WITH CONCENTRIC COATINGS

Roger D. Driskill, Seymour, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,760

Int. Cl.[2] B29C *27/30*

U.S. Cl. 425—113 **10 Claims**



1. An extruder for the continuous forming of a concentric coating of heat curable plastic material around an elongated core member, comprising an extruder housing having an inlet located in an upstream portion and an outlet located in a downstream end thereof, a rotatable extrusion screw extending from upstream of the inlet substantially through the length of the extruder housing towards the downstream outlet having a free downstream end and conically converging end portion, said rotatable screw being provided with a longitudinal coaxial bore extending the length thereof, the outlet in the downstream end of the housing comprising a forming die orifice provided with a converging entry surface leading into the forming die orifice, and an annular guide means spaced from said free end of the extrusion screw concentrically aligned with the forming die orifice mounted in fixed mechanical relationship with the converging entry to the die orifice in close proximity to the die orifice and contoured to compliment the surface of the converging entry to the die orifice.

4,174,936

APPARATUS FOR MANUFACTURING CELLULAR LIGHTWEIGHT CONCRETE PRODUCTS

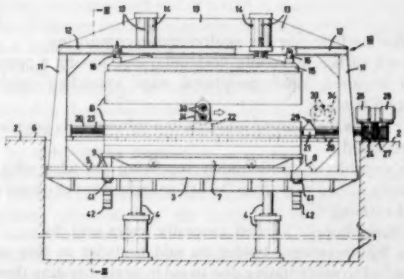
Rolf E. Göransson, Åkarp, Sweden, assignor to Internationella Siporex AB, Malmo, Sweden

Division of Ser. No. 624,079, Oct. 20, 1975, Pat. No. 4,083,909. This application Jan. 17, 1978, Ser. No. 870,141

Claims priority, application Sweden, Oct. 31, 1974, 7413712

Int. Cl.[2] B28B *3/12*

U.S. Cl. 425—297 **7 Claims**



4. An apparatus for dividing a plastic, cellular and at least generally parallelepipedic body of concrete mass resting in a fully exposed position on a movable support comprising in combination: a substantially rectangular bearing surface, on

which the movable support with the body thereon is receivable; two holders located on opposite sides of said bearing surface and at a distance from each other exceeding the corresponding dimension of the body to be divided; a cutting wire stretched between said two holders and extending in a plane that is at least approximately horizontal; means for effecting a guided horizontal reciprocating motion between the body resting on its support on said bearing surface and said holders with the cutting wire between them in a direction that is lateral to the wire itself so as to cause said wire to cut through the body at each stroke; means for changing the relative vertical position between said bearing surface and said holders with the cutting wire between them after each completed body-cutting stroke of said wire so as to cause said wire to cut through the body at different levels and, hence, to divide the body into a plurality of slab-like slices lying one on top of the other; a vertically movable suction head mounted above said bearing surface and adapted for engaging with and adhering by suction to the top face of the body to be divided, while leaving all the vertical faces thereof substantially free, means for elevating and lowering said suction head in order to effect, after each completed body-cutting stroke of said cutting wire, first a lifting of the uppermost part of the cut body and subsequently a redeposition thereof, before the next body-cutting stroke is started; and a horizontally reciprocatable unit for working at least one of the two cut surfaces obtained at each body-cutting stroke of said wire, said unit being movable independently of said holders and cutting wire.

4,174,937

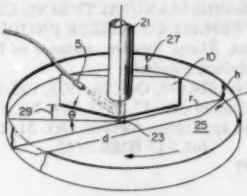
POWDER AGGLOMERATOR AND ITS METHOD OF USE

Danton L. Paulson, and Robert B. Worthington, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 559,936, Mar. 19, 1975. This application Sep. 15, 1978, Ser. No. 942,834

Int. Cl.[2] B22F *3/00*

U.S. Cl. 425—222 **4 Claims**



1. A fine particle powder agglomerator comprising:

a smooth surface generally horizontal disc having a center and a raised outer peripheral edge extending totally around thereof;

power means for rotating said disc at a substantially constant edge speed;

means capable of continuously supplying particles with a diameter of no more than 0.01 of an inch near the center of said rotating disc;

a discharge hopper located generally under said disc;

means for spraying a binder on said particles as they are supplied to said rotating disc to aid in agglomerating them; and

means located near said supply for causing the deposited particles to assume an outwardly increasing sloping configuration from the disc's center to its raised edge.

4,174,938

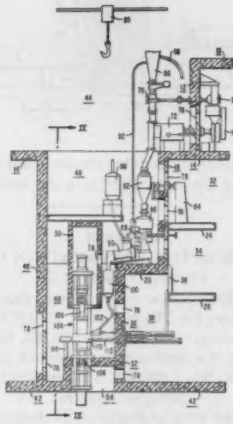
REMOTE NUCLEAR GREEN PELLET PROCESSING APPARATUS

Francis Cellier, Export, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 765,485, Feb. 4, 1977, abandoned. This application Aug. 26, 1977, Ser. No. 828,059

Int. Cl.[2] B29C *1/00*

U.S. Cl. 425—317 **3 Claims**



1. Apparatus for manufacturing nuclear fuel pellets comprising:

a restricted access area defined by a plurality of radiation protective vertical walls and horizontal floors offset from each other which contain components for manufacturing nuclear fuel pellets;

a limited access area defined by said protective walls and floors and separated from said restricted access area by said protective walls and floors for containing working personnel for operating and maintaining said components, said components comprising;

a compactor feed hopper disposed in said restricted access area and attached to one of said walls for collecting the nuclear fuel material to be made into nuclear fuel pellets, a star feeder valve disposed in said restricted access area below and laterally to said compactor feed hopper and connected to said compactor feed hopper for controlling the flow from said compactor feed hopper, a roll compactor connected to said star feeder valve and disposed in said restricted access area for rolling said fuel material into ribbon-like strips of various lengths, a granulator connected to said roll compactor and disposed in said restricted access area below and laterally to said roll compactor for granulating said ribbon-like strips into granules, a classifier connected to said granulator and disposed in said restricted access area below and laterally to said granulator for separating said granules according to size and allowing properly sized granules to remain in the process stream, a bulk density check station connected to said classifier and disposed in said restricted access area below and laterally to said classifier for checking the density of said granules, a stearate feed hopper disposed in said restricted access area for collecting stearate material, a rolling drum connected to said stearate feed hopper and said bulk density check station and disposed in said restricted access area below and laterally to said bulk density check station and said stearate feed hopper for mixing said granules with said stearate, a pellet press feed hopper connected to said rolling drum and disposed in said restricted access area below and laterally to said rolling drum for collecting said mixture of said granules and said stearate, and a pellet press connected to said pellet press

feed hopper and disposed below and laterally to said rolling drum for forming said mixture into nuclear fuel pellets, said components being disposed below and laterally relative to the preceding component thereby allowing said nuclear material to flow between said components under the influence of gravity and allowing said components to be vertically manipulated without interfering with the other components.

4,174,939
LATCH FOR THREE-PART MOLD

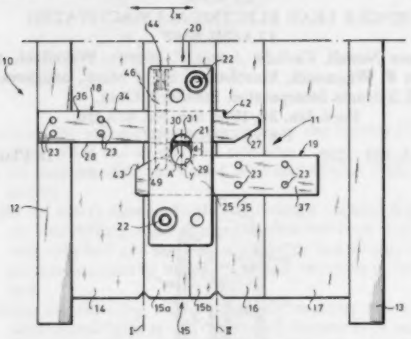
Klaus-Bernd Fenner, Lüdenscheid, Fed. Rep. of Germany, assignor to Hasco-Normalien Hasenclever & Co., Lüdenscheid, Fed. Rep. of Germany

Filed Sep. 19, 1978, Ser. No. 943,616

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742166

Int. Cl.[2] B29C *1/00*

U.S. Cl. 425—451.9 **10 Claims**



1. A latch for a mold having an inner mold part sandwiched between a pair of the outer mold parts, said parts being relatively displaceable in a longitudinal direction, said arrangement comprising:

a control bar rigid with one of said outer parts and extending longitudinally toward the other outer part;

a locking bar rigid with said other outer part and extending longitudinally toward said one outer part adjacent said control bar;

a locking pin transversely movable but longitudinally fixed on said inner part and engageable with both of said bars; and

means including formations on said bars engageable with said pin for preventing relative longitudinal displacement of said other and inner parts during opening of said mold prior to separation beyond a predetermined spacing of said one and inner parts.

4,174,940
APPARATUS FOR AUTOMATICALLY HANDLING A MOLD FOR TIRES WITH A RIGID SEGMENTED CORE

Augusto Pizzorno, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

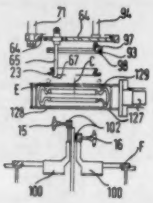
Division of Ser. No. 830,870, Sep. 6, 1977. This application Oct. 2, 1978, Ser. No. 947,714

Claims priority, application Italy, Sep. 13, 1976, 27139 A/76

Int. Cl.[2] B29H *5/02*; B29F *1/00*

U.S. Cl. 425—577 **24 Claims**

1. An apparatus for driving a mold for making a tire, said mold consisting essentially of an outer envelope and an inner body joined to define the required shape of the tire, said inner body consisting of a core having sectors which can be radially taken to pieces, and at least two annular elements, an upper one and a lower one, separable from each other and from the core in the direction of the core axis, said elements having at least two surfaces which form axially inner surfaces for the beads of the tire to be made, said apparatus consisting essentially of an upper frame, a lower frame having a face for the mold horizontally arranged thereon, said frames having their vertical central axes lined up with each other to form the vertical central axis of the apparatus, said apparatus being further characterized by the fact of consisting essentially of one device for spreading out the sidewalls of the tire in different phases and one operating mechanism for the spreading-out device respectively on the



upper frame and locking means for the lower annular element in the final and locking means for the lower annular element in the final position corresponding to the lower sidewall when spread out, means for effecting contemporary radial movements of a first and second part of the sectors, means for the vertical displacement of said first part of the sectors that have already been moved radially and at the same time towards the center of the apparatus.

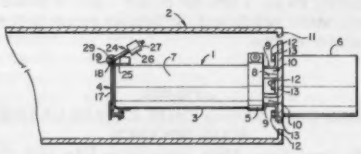
4,174,941
SLEEVE AND DAMPER FOR OIL BURNER

Ralph C. Parkes, Rydal, Pa., assignor to The National Drying Machinery Corp. of America, Philadelphia, Pa.

Filed Dec. 6, 1977, Ser. No. 857,903

Int. Cl.[2] F23N *5/00*; F23D *15/02*

U.S. Cl. 431—3 **19 Claims**



14. A process for the clean combustion of fuel oil in an installation of the type wherein an oil burner is provided with a sleeve, one connected end of which is supported in proximity to the oil burner and the other remote end of which is equipped with a damper comprising

burning fuel oil in the oil burner to produce a flame and a small percentage of unburned fuel oil particles;

directing the flame from the oil burner into the sleeve;

retaining some of the heat from the flame within the sleeve by utilizing the damper;

maintaining the temperature within the sleeve above that required for the automatic ignition of the fuel oil;

igniting automatically the unburned particles of fuel oil within the sleeve;

building up pressure within the sleeve during the burning of the fuel oil and mantaining constant the pressure by operation of the damper;

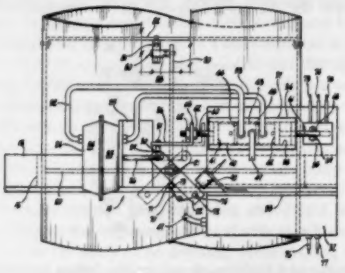
whereby fuel oil not fully ignited by the oil burner is automatically ignited within the sleeve to provide complete combustion of the fuel oil.

4,174,942

FLUE CONTROL ASSEMBLY

Donald A. McArthur, 4301 Arco, St. Louis, Mo. 63110

Filed Jul. 25, 1977, Ser. No. 818,449
Int. Cl.[2] F23N *3/00*
U.S. Cl. 431—20 **11 Claims**



1. A flue control assembly for a combusiton chamber having an electrically actuated, thermostatic switch controlled burner valve circuit, the assembly comprising:

(a) flue means,

(b) damper means pivotally mounted in the flue means, for movement between an open position and a closed position,

(c) fluid operated actuating means including movable means operatively connected to the damper means for rotating said damper means between said open position and said closed position,

(d) fluid pump means,

(e) conduit means connecting the pump means to the actuating means,

(f) valve means between the pump means and the actuating means said valve means selectively supplying fluid from the pump means through the conduit means to the actuating means to move the damper means from an open position to a closed position and from a closed position to an open position, and

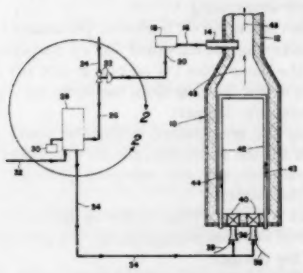
(g) switching means connected to the burner valve circuit and conditioning the pump means to supply fluid to the actuating means when the burner valve is closed by the thermostatic switch and the damper means is in a predetermined position.

4,174,943

FUEL GAS PREHEAT FOR EXCESS OXYGEN MAINTENANCE

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Oct. 31, 1977, Ser. No. 847,227
Int. Cl.[2] F23N *5/18*
U.S. Cl. 431—41 **2 Claims**



1. In a furnace for combustion of gaseous fuels, said furnace having an outlet stack for the products of such combustion, said fuels having a wide range of molecular weights and calorific values, and including burner means in which a selected percentage of all of the combustion air is provided by inspiration, due to the flow energy of the fuel; the improvement in apparatus for providing full combustion air requirements, comprising;

means to preheat said fuel so as to vary the temperature of said fuel in relation to the molecular weight and calorific value of said fuel; and

means to monitor the percentage of excess oxygen in the products of combustion of said fuel on the way to the stack; and means responsive to said means to monitor, to control the heating of said fuel;

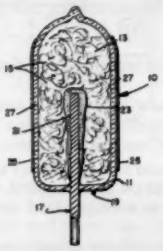
whereby, as the percentage of oxygen increases, the temperature of heating of said gaseous fuel decreases, and vice versa.

4,174,944

SINGLE LEAD ELECTRICALLY-ACTIVATED FLASHLAMP

P. Bruce Newell, Carlisle; James C. Morris, Wakefield, and John F. Waymouth, Marblehead, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,250
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—359 **18 Claims**



1. An electrically-activated flash lamp comprising:

a hermetically-sealed, light-transmitting envelope defining a chamber therein;

a combustion-supporting atmosphere within said chamber;

a quantity of filamentary combustible material within said chamber;

a single electrically conductive lead member secured to and extending from one end of said envelope, said conductive lead member having an end portion protruding within said chamber;

a quantity of primer material covering said protruding end portion of said lead member; and

an electrically conductive coating positioned on the external surface of said envelope in capacitively coupled relationship to said filamentary combustible material within said chamber, said capacitive coupling occurring through the wall of said envelope.

4,174,945

CORRUGATED PANEL AND APPARATUS FOR MANUFACTURING THE SAME

David C. Gertz, 6 N. 139 Weber Dr., St. Charles, Ill. 60174

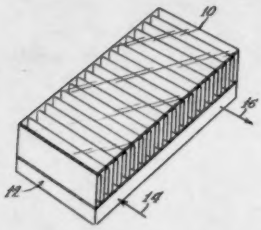
Division of Ser. No. 776,519, Mar. 11, 1977, abandoned. This application May 30, 1978, Ser. No. 910,272
Int. Cl.[2] B29C *27/12*
U.S. Cl. 425—501 **6 Claims**

1. Vacuum forming apparatus for producing a corrugated sheet, comprising:

a continuous conveyor belt;

a pair of spaced rotary elements, at least one of which is adapted to be driven, and rotatable about parallel axes, said belt being trained about said rotary elements with one side in contact therewith for movement in a closed path about said elements, said closed path having arcuate segments at said rotary elements;

a plurality of flutes extending across said belt and carried thereby in substantially equally spaced relation and projecting away from said belt on the side thereof opposite said one side to define a plurality of pockets each having a bottom defined by said belt;



at least one vacuum passage opening to the bottom of each said pocket and to said belt one side;

a vacuum manifold associated with one of said rotary elements;

said one rotary element further including a vacuum distributor establishing fluid communication between said vacuum manifold and said belt one side for at least part of the arcuate segment of said path at said one rotary element; and

means for directing a sheet of plastic material in a plastic state to said flutes at said one rotary element at or prior to the associated arcuate segment of said path.

4,174,946

PROCESS FOR DRYING COAL IN TWO-STAGE FLOW-THROUGH CIRCULATION HEATERS

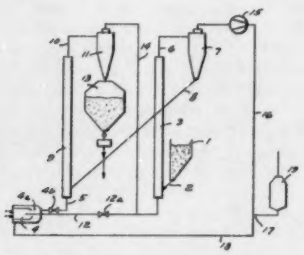
Wolfgang Rohde, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,254

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640508

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—14 **7 Claims**



1. In a process of drying coal in a two-stage thermal operation of the type wherein coal is passed in finely divided form together with a fresh heat carrier gas into the lower end of a first elongated flow-through heating element, the coal and vapors withdrawn at the upper end of the first heating element are passed to a first separator where the partly dried coal is separated from the vapors, the separated coal and a fresh heat carrier gas are then passed into the lower end of a second elongated flow-through heating element, the coal and spent heat carrier gas withdrawn at the upper end of the second heating element are passed to a second separator, and the substantially dry separated coal is recovered from the second separator, the improvement comprising generating hot combustion gas having a temperature of about 1500° C.; mixing a portion of the hot combustion gas with the spent carrier gas withdrawn from said second heating element to obtain fresh carrier gas having a temperature lower than the combustion gas; admitting the thus obtained lower temperature carrier gas directly into said first heating element; mixing at least part of the vapors withdrawn from said first heating element with another portion of the hot combustion gas to obtain fresh carrier gas having a temperature higher than said vapors; and admitting the thus obtained higher temperature carrier gas directly into said second heating element.

4,174,947

INSTALLATION AND PROCESS FOR REGULATING THE PREHEATING OF COKING COAL

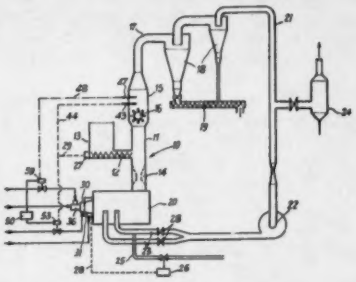
Serge L. Delessard, Forbach, and Roger M. Puff, Hombourg-Haut, both of France, assignors to Charbonnages de France, Paris, France

Filed Jan. 18, 1978, Ser. No. 870,594

Claims priority, application France, Jan. 24, 1977, 77 01871

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—15 **10 Claims**



6. For maintaining at desired temperature values, in any circumstances, a coal preheating installation having at least one drying chamber fed with a fluidisation agent, a combustion chamber having a main neutral combustion burner producing a hot neutral gas serving as entrainment agent and as drying and fluidisation agent, and means for regulating the feeding of the main burner with liquid or gaseous fuel which are controlled by means for measuring the temperature in the fluidisation chamber, a process comprising:

providing an auxiliary burner having a thermal power range lower than the lowest power of the range of power of said main burner and;

regulating said auxiliary burner in dependence on the temperature measured in the fluidisation chamber at least during periods of extinction of the main burner, thereby extending in the downward direction the range of regulation of thermal power in the combustion chamber.

4,174,948

MANIFOLD INPUTS AND OUTPUTS FOR FURNACE REGENERATORS

Robert O. Bradley, Toledo, Ohio; Heywood J. Knighton, Grosse Pointe Park, Mich., and Robert J. Naveaux, Toledo, Ohio, assignors to Toledo Engineering Company, Toledo, Ohio

Filed Mar. 6, 1978, Ser. No. 883,696

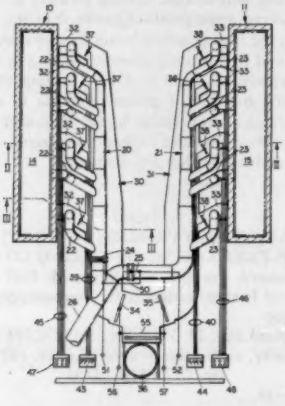
Int. Cl.[2] C21B *9/12*; F27D *17/00*

U.S. Cl. 432—54 **11 Claims**

1. A regenerator system for a furnace having a pair of elongated regenerators through which intake air and exhaust gases alternately pass, and each said generator having a longitudinal

duct along its top connected to a plurality of side ports said system comprising:

(A) an input manifold for said intake air to each regenerator, said manifold having branch ducts spaced along and connected to its said regenerators,



(B) an output manifold for exhaust gases from each regenerator, said manifold having branch ducts spaced along and connected to its said regenerator,

(C) separately operative gates in each of said branch ducts, and

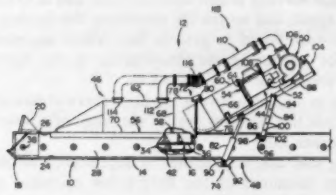
(D) separate reversing valve means between said input manifolds and between said output manifolds.

4,174,949

BURNER AND EXHAUST CONTROL ASSEMBLIES FOR USE WITH AN APPARATUS FOR CONVEYING PARTICULATE MATERIAL

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Aug. 29, 1977, Ser. No. 828,750
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—58 8 Claims



1. In a conveyor apparatus in which a conveyor is supported by a plurality of pulleys and enclosed by a conveyor housing having an input end and an output end, the conveyor powered to convey particulate material from the input end for discharge from the output end which is disposed vertically higher than the input end, the improvement comprising:

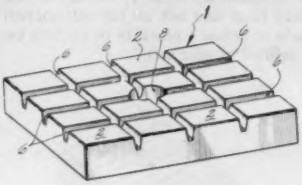
burner means, supported by the conveyor housing between the input end and the output end and including a flame burner, for directly heating the particulate material conveyed by the conveyor via the flame burner in one position thereof, and for indirectly heating the particulate material conveyed by the conveyor via the products of combustion only of the flame burner in one other position thereof.

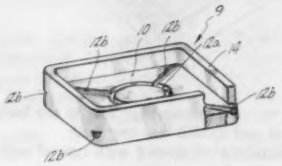
4,174,950

CERAMIC BASE AND CAP USEFUL IN FIRING CERAMIC SHELL MOLDS

Henry A. Jalbert, Willimantic, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1977, Ser. No. 861,777
Int. Cl.[2] F27D *5/00*
U.S. Cl. 432—6 11 Claims





1. A preformed ceramic base useful for firing a ceramic shell mold having an open bottom end and a mold cavity in communication therewith, comprising:

a ceramic member having a preformed working surface which includes a majority of flat surface portions on which the mold base is suported and maintained with desired flatness during firing and one or more groove-like surface portions which define one or more gas circulation passages from the outside atmosphere into the open bottom end of the mold adjacent the ceramic base when the open bottom end of the mold is placed in supported relation on the flat surface portions, said passages permitting gas circulation through the mold interior during firing to minimize hot spots therein.

10. A method for firing a plurality of ceramic shell molds having open bottom ends which are the mold bases and open top ends, comprising:

(a) providing a plurality of preformed ceramic firing bases, each base including a preformed working surface which comprises a majority of flat surface portions on which the mold base is supported and maintained with desired flatness throughout firing and one or more groove-like surface portions extending across the working surface and terminating at the edge periphery at spaced apart locations to define one or more gas circulation passages when the mold base is placed in supported relation on the flat surface portions thereof, said passages being in communication with the outside atmosphere at their terminating locations along the edge periphery of the ceramic firing base and with an opening in the open bottom end adjacent the firing base;

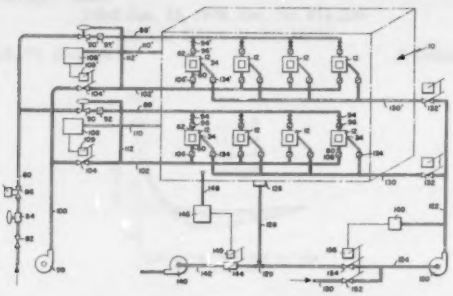
(b) placing each ceramic shell mold on a ceramic firing base so that the mold base is in supported relation on the flat surface portions of the working surface and the gas circulation passages are defined therebetween, and arranging the ceramic firing bases in working relation to one another such that the terminating locations of the gas circulation passages of one firing base are in opposed gas flow relation with those of an adjacent firing base, thereby providing a more or less continuous network of interconnected passages to permit gas circulation through each shell mold during firing to minimize hot spots therein.

4,174,951

FURNACE HEATING SYSTEM

Quentin M. Bloom, Newtown, Pa., assignor to Bickley Furnaces, Inc., Philadelphia, Pa.

Filed Sep. 6, 1977, Ser. No. 830,799
Int. Cl.[2] F27B 9/36
U.S. Cl. 432—133 12 Claims



1. A system for heating a furnace having a heating chamber defined by a furnace wall comprising:

a plurality of individual burner assemblies mounted on the furnace wall to direct heating gas streams into the heating chamber,

each of said burner assemblies having

means defining a diffusion chamber,

a burner means arranged to direct its products of combustion through said diffusion chamber into the furnace heating chamber,

and means for directing the flow of diffusion gas into said diffusion chamber to admix with said burner products of combustion so that the gas stream entering the furnace heating chamber has a greater mass velocity than the burner products of combustion,

means for supplying diffusion gas to said diffusion gas directing means of each of said burner assemblies,

said diffusion gas supply means being connected to the heating chamber of said furnace at a location to withdraw hot products of combustion gases from said furnace heating chamber and being connected to each of said burner assemblies for delivering said hot products of combustion gases thereto, said burner means of each of said burner assemblies being adapted to burn a mixture of fuel gas and air,

means for supplying fuel gas through a supply line to each of said burner assemblies,

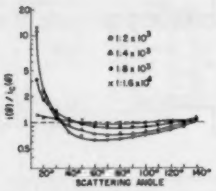
and means for supplying combustion air through a supply line to each of said burner assemblies, each of said burner assemblies having means for balancing the flow of fuel gas and the flow of combustion air to said burner means thereof.

4,174,952

IMMUNOASSAY BY LIGHT SCATTERING INTENSITY ANISOTROPY MEASUREMENTS

David S. Cannell, Santa Barbara, Calif.; Marzio Giglio, Milan, Italy; George B. Benedek, Belmont, Mass.; Gustav K. von Schulthess, and Richard J. Cohen, both of Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 23, 1978, Ser. No. 871,294
Int. Cl.[2] G01N *21/24, 33/16*
U.S. Cl. 23—230 B 5 Claims



1. The process for determining the concentration of a substance which promotes or inhibits an agglutination reaction including an agglutinant coated on carrier particles which comprises:

(a) preparing a plurality of samples by mixing a known concentration of an agglutinant coated on a carrier with either known varying concentrations of the agglutinant or with a mixture of a fixed concentration of the agglutinant with varying concentrations of an agglutination inhibitor, said carrier having a particle size between about 0.07 and 2 microns and a poly-dispersity in diameter of less than about 20%, exposing an agglutinated reaction product of said agglutinant and an agglutinator to a beam of essentially monochromatic light, measuring the intensity of scattered light due to each of said reaction products at two different angles, said angles being the same for each reaction product and determining the quantitative relationship between the ratio of the intensity of scattered light by said agglutinated reaction products at said two angles thereby to establish a standard agglutination curve that relates agglutinator concentration or agglutinant concentration with the ratio of the intensity of scattered light at said two angles,

(b) mixing either a fixed concentration of the agglutinant coated on the carrier or a mixture of a fixed concentration of the agglutinant coated on the carrier and a fixed concentration of the agglutinant in solution with one or more dilutions of the substance being tested, said substance acting either as an agglutinant or as an inhibitor to form at least one agglutinated reaction product of the dilutions,

(c) determining the ratio of the intensity of the scattered light at said two angles by the agglutinated reaction product of the dilutions of the substance being tested,

(d) comparing the ratio of the scattered light intensity of the agglutinated reaction product obtained in step (c) with the quantitative relationship determined by step (a) thereby to determine the concentration of the substance being tested from said standard agglutination curve.

4,174,953

PROCESS FOR REMOVING SULFUR FROM COAL

Jui-Yuan Sun; Jin S. Yoo, both of South Holland; Emmett H. Burk, Jr., Glenwood, all of Ill., and George P. Masologites, Columbus, N.C., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jan. 3, 1978, Ser. No. 866,589
Int. Cl.[2] C10L *9/10;* C10B *57/00*
U.S. Cl. 44—1 R 19 Claims

1. A process for reducing the sulfur content of coal comprising the steps of:

(1) contacting coal particles with

(i) a silicate selected from the group consisting of alkali metal silicates, alkaline earth metal silicates and mixtures thereof, and

(ii) a promoter material capable of oxidizing or reducing equilibrium sulfur reaction products formed by the contacting to non-equilibrium reaction products

in an aqueous medium to reduce the sulfur content of coal; and

(2) recovering coal particles of reduced sulfur content.

16. The process of claim 1 wherein the promoter material is selected from the group consisting of air, oxygen, hydrogen peroxide, and alkali metal sulfite.

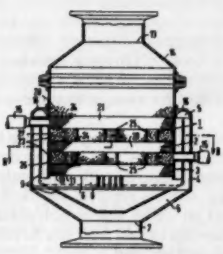
18. The process of claim 1 wherein the promoter material is selected from the group consisting of H_2, CO, $K_2S_2O_4$, NaS_2O_4 and alkali metal polythionites.

4,174,954

METHOD FOR CONVERTING A REACTION MIXTURE CONSISTING OF HYDROCARBON-CONTAINING FUEL AND AN OXYGEN-CONTAINING GAS INTO A FUEL GAS

Walter Kusebauch, Erlangen; Hana Kostka, Nürnberg-Grossgründlach; Hans-Joachim Henkel, Erlangen; Christian Koch, Erlangen; Eugen S. de Bucs, Erlangen, and Theo Weber, Adlitz b. Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 747,935, Dec. 6, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 878,767
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558922
Int. Cl.[2] C10G *11/28;* C01B *2/16*
U.S. Cl. 48—212 18 Claims



1. A method of converting a reaction mixture consisting of atomized, vaporized or evaporated liquid, hydrocarbon fuel and a gas containing oxygen into a fuel gas at an elevated temperature in a gas generator including a reaction chamber comprising

(a) imbedding a plurality of plates comprising porous ceramic sintered slabs containing a multiplicity of passage openings and having a surface which is catalytically active with respect to hydrocarbon fuels in a bed of packing material made up of a plurality of packing material grains such that said plates are diposed spaced one behind the other perpendicular to the flow direction of the reactants through the reaction chamber, said plates having a higher thermal conductivity than the packing material bed; and

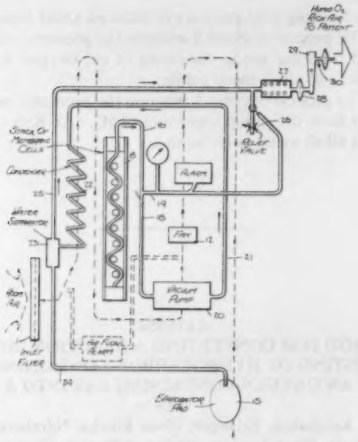
(b) passing the reaction mixture through said reaction chamber to convert it into a fuel gas.

4,174,955

MEMBRANE OXYGEN ENRICHER APPARATUS

Richard H. Blackmer, Scotia, and Jonathan W. Hedman, Burnt Hills, both of N.Y., assignors to Oxygen Enrichment Co., Ltd., Schenectady, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,425
Int. Cl.[2] B01D *13/00*
U.S. Cl. 55—158 **12 Claims**



1. In an apparatus for providing air enriched with oxygen, said apparatus having an array of selectively permeable membrane cells, said cells being adapted to permit oxygen to permeate to an interior cavity thereof at a greater rate than nitrogen to form a flow of oxygen-enriched air in said interior cavity; means for developing a flow of atmospheric air across said array; conduit means through which air enriched with oxygen is drawn off from said interior cavity of said cells; a partial vacuum maintaining means interconnected with said conduit means to draw the oxygen-enriched air through said conduit means; the improvement comprising:

a membrane stack box enclosing said array and having an inlet port for flow of atmospheric air and an outlet port in a non-planar orthogonal displaced relationship to said inlet port for a flow of nitrogen enriched air whereby virtually the entire flow of air is directed through said membrane stack box in a manner to achieve noise suppression;

a cabinet core comprising a housing structure for said partial vacuum maintaining means, said housing structure having an inlet slot communicating with said outlet port of said membrane stack box to receive the flow of nitrogen-enriched air and an outlet slot in non-planar orthogonal displaced relationship to said inlet slot to exhaust the flow of nitrogen enriched air; and

a cabinet forming together with said membrane stack box and said cabinet core an atmospheric air inlet duct in communication with said membrane stack box inlet port and an air exhaust duct in communication with said housing structure outlet slot.

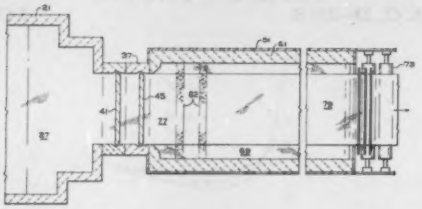
4,174,956

METHOD AND APPARATUS FOR MOLTEN METAL FLOW DIFFUSION IN A FLOAT GLASS TANK

Robert Gagne, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 26, 1978, Ser. No. 928,047
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A **19 Claims**

1. A method of reducing optical distortion, caused by molten metal of nonuniform temperature closely adjacent to a glass ribbon as it passes through a float chamber comprising positioning a barrier in the molten metal across the zone of molten metal movement, said barrier having grooves on its upper surface, closely adjacent and angularly transverse the direction of movement of closely adjacent molten metal in the molten metal bath, said grooves being of sufficient depth such that the molten metal movement closely adjacent said glass is angularly diverted from said direction of movement by said grooves as said glass passes over said barrier.



7. A float glass forming chamber barrier comprising an elongated member adapted to be fastened transverse of a float glass bath and having a grooved upper surface wherein the grooves of said upper surface are cross-cut and of a depth sufficient to angularly divert movement of molten metal closely adjacent to float glass passing over said barrier when said barrier is transverse of a float forming chamber.

4,174,957

SYNTHETIC GROWING MEDIUM AND METHOD OF PREPARING IT

Jack Webb, Madison, Ohio, and Stanley L. Schwartz, Sands Point, N.Y., assignors to Hydrosoil Corporation, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,613
Int. Cl.[2] C05C *9/02*; C05G *3/04*
U.S. Cl. 71—24 **8 Claims**

1. A synthetic growing medium for plants comprising water-insoluble urea formaldehyde foam granules, powdered peat-like humus, and a wetting agent, the wetting agent being carried by the powdered humus particles, the powdered humus completely coating each foam granule, and the foam granules being unbonded to each other so that the entire mass of coated foam granules is loose and free flowing and can be intimately mixed with or used in placed of natural soil.

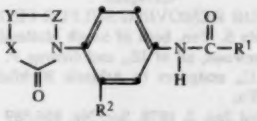
4,174,958

ANILIDE DERIVATIVE HERBICIDES

Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

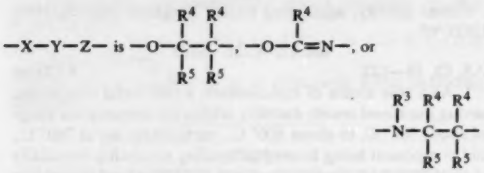
Continuation-in-part of Ser. No. 867,748, Jan. 9, 1978, abandoned. This application Sep. 15, 1978, Ser. No. 942,522
Int. Cl.[2] A01N *9/22*; C07D *271/10*
U.S. Cl. 71—88 **11 Claims**

1. A compound of the formula



wherein R^1 is a hydrogen atom, an alkyl group containing 1 to 4 carbon atoms or an alkenyl group containing 2 to 3 carbon atoms or a cyclopropyl group of the formula

wherein R^7 is a hydrogen atom or methyl; R^2 is CF_3 bromo, chloro or methyl;



in which R^3 is independently a hydrogen atom or an alkyl group containing from 1 to 6 carbon atoms; each R^4 is independently a hydrogen atom, an alkyl group containing from 1 to 6 carbon atoms or a cycloalkyl group containing from 3 to 5 ring carbon atoms and a total of 3 to 6 carbon atoms, and each R^5 is independently a hydrogen atom or an alkyl group containing from 1 to 2 carbon atoms.

8. An herbicidal composition comprising an herbicidally effective amount of a compound according to claim 1 and at least one surface-active agent or carrier therefore.

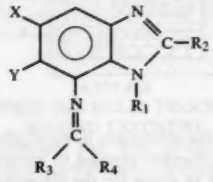
4,174,959

BENZIMIDAZOLE COMPOUNDS

Philip L. Strong, Anaheim, Calif., and Wayne S. Belles, Moscow, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Apr. 24, 1978, Ser. No. 899,129
Int. Cl.[2] A01N *9/22*; **C07D** *235/14*
U.S. Cl. 71—92 **18 Claims**

1. A compound of the formula



wherein R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl, halo-lower alkyl, lower cycloalkyl, lower alkoxy-lower alkyl, hydroxy-lower alkyl and dilower alkylamino, R_3 is selected from hydrogen, lower alkyl and monocyclic aryl, R_4 is selected from lower alkyl, lower alkenyl and monocyclic aryl, or R_3–R_4 taken together represent alkylene of about 3 to 7 carbon atoms, X is selected from halo, lower alkyl, halo-lower alkyl, lower alkylsulfonyl, and halo-lower alkylsulfonyl, and Y is hydrogen, halo or lower alkoxy, in which not more than one of said R_1 and R_2 represents hydrogen and wherein said monocyclic aryl is selected from phenyl, nitrophenyl, halophenyl, lower alkylphenyl and lower alkoxyphenyl groups.

4,174,960

PESTICIDAL FORMULATION

Barry A. Hendriksen, Bracknell, England, assignor to Lilly Industries Limited, Henrietta Place, United Kingdom

Filed Feb. 2, 1978, Ser. No. 874,599
Int. Cl.[2] A01N *17/00*
U.S. Cl. 71—121 **18 Claims**

1. A herbicidal formulation in concentrate form being an aqueous emulsion comprising

10% to 75% by weight of a herbicide being one or more herbicidal 2,6-dinitroaniline derivative having a solubility in water at 25° C. less than 100 parts per million by weight and a melting point in the range of from −10° C. to 150° C.,

0% to 60% by weight of a substantially water-immiscible solvent, the herbicide and the solvent forming a homogeneous disperse phase,

0.5% to 10% by weight of an emulsifying agent, and

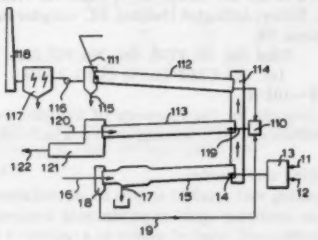
15% to 70% by weight of an aqueous solution of an inorganic salt, the concentration of the inorganic salt in the aqueous solution and the pH of said aqueous solution being not greater than 9 being at least 5% by weight.

4,174,961

METHOD FOR WORKING-UP WASTE SLAG FROM THE OXYGEN STEEL PRODUCTION

Andreas G. J. Wolfs, Lanaken, Belgium, and Lambertus H. Goessens, Maastricht, Netherlands, assignors to Eerste Nederlandse Cement Industrie (ENCI) N.V., Maastricht, Netherlands and C.B.R. Cementbedrijven N.V., Brussels, Belgium, a part interest to each

Filed Nov. 1, 1977, Ser. No. 847,509
Int. Cl.[2] C21B *3/04*
U.S. Cl. 75—30 **7 Claims**



1. A method of treating waste slag from oxygen steel production (L.D.-slag), involving reduction of iron and maganese oxide being present in the slag to their metals after addition of an Al_2O_3-containing additive and heating the total composition, the iron and the manganese being subsequently separated therefrom, which comprises the steps of:

(1) mixing said L.D.-slag and said Al_2O_3-containing additive being present in the form of a silicate selected from the group consisting of at least one of the waste products of coal mine products including stone-sludge, fly ash, schists, clays, clay-containing waste materials and blast furance slag;

(2) mixing said L.D.-slag in a ratio of 55–97½ parts to 45–2½ parts of said Al_2O_3-containing additive:

(3) mixing said L.D.-slag with carbon, or with carbon combined with carbon-containing coal mine waste materials;

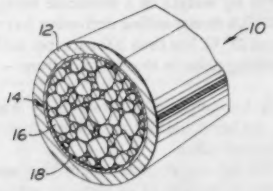
(4) heating the composition so obtained to a temperature of between about 1250° C. to 1500° C., and allowing reduction of said iron and manganese oxides during heating; and

(5) recovering iron and maganese in molten state from the slag.

4,174,962
FILLED TUBULAR ARTICLE FOR CONTROLLED INSERTION INTO MOLTEN METAL

John G. Frantzreb, Sr., and C. David Weiss, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 27, 1978, Ser. No. 900,634
Int. Cl.[2] C22B 9/10
U.S. Cl. 75—33 26 Claims



1. A filled tubular article (10) for controlled insertion into a molten metal having a preselected temperature for altering same, comprising:

an elongated metal conduit (12) having an internal surface (20) and a melting temperature above said preselected temperature; and

a core (14) having treating agent means (16) of a first material for controllably treating the molten metal and liquifying agent means (18) of a second material different than said first material for liquifying at said preselected temperature and accelerating the dissolving of said internal surface (20) of said conduit (12), said treating agent means (16) and said liquifying agent means (18) being discrete members in intimate contact within said conduit (12) and arranged in preselected proportions by weight.

4,174,963
RECOVERY OF TITANIUM METAL VALUES

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 31, 1978, Ser. No. 929,605
Int. Cl.[2] C21B 15/00; C01G 23/04
U.S. Cl. 75—101 R 5 Claims

1. In a process for the recovery of titanium metal values from a titanium and iron bearing source which comprises the steps of:

(a) crushing said source;

(b) subjecting said crushed source to an oxidation treatment with an oxidizing agent at an elevated temperature;

(c) subjecting said crushed source to a reductive roast in the presence of a reductant at an elevated temperature;

(d) leaching the resultant reduced source with a leach solution comprising hydrogen chloride;

(e) separating insoluble gangue from the soluble metal chlorides;

(f) precipitating titanium dioxide from the soluble metal chlorides by treatment with iron oxides; and

(g) separating and recovering said titanium dioxide, the improvement which comprises using as said reductant in said reductive roast step (c) a mixture of about 50% carbon monoxide and 50% hydrogen in an amount of from about two to three times the amount which is stoichiometrically required to reduce the iron oxide present in said source to metallic iron and the following recovery of titanium dioxide in step (g) reducing the temperature of the solution remaining to crystallize ferrous chloride, recovering the solid ferrous chloride, reducing a major portion of said ferrous chloride to form metallic iron and hydrogen chloride, recovering the iron and recycling the hydrogen chloride to leach step (d) as a portion of the leach solution, oxidizing the other portion of said ferrous chloride to form iron oxides and recycling said oxides to step (f).

4,174,964
NICKEL-BASE ALLOYS OF IMPROVED HIGH TEMPERATURE TENSILE DUCTILITY

Stuart W. K. Shaw, Sutton Coldfield, and Paul I. Fontaine, Solihull, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

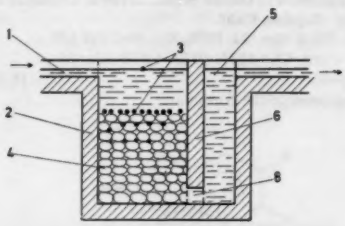
Continuation-in-part of Ser. No. 191,544, Oct. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 84,528, Oct. 27, 1970, abandoned. This application Jan. 25, 1974, Ser. No. 436,539
Claims priority, application United Kingdom, Oct. 28, 1969, 52821/69
Int. Cl.[2] C22C 19/03
U.S. Cl. 75—122 4 Claims

1. As a new article of manufacture, a cast metal component having improved tensile ductility within the temperature range of about 700° C. to about 800° C., particularly about 760° C., said component being formed of an alloy consisting essentially of up to 10.5% chromium, from 4% to 12% in total of titanium plus aluminum, up to 20% cobalt, up to 25% tungsten, up to 10% molybdenum, up to 12% tantalum, up to 6% niobium, up to 5% iron, up to 3% vanadium, up to 1.5% zirconium, up to 0.5% carbon, up to 0.5% manganese, up to 0.3% silicon, up to 0.3% boron, and from 0.005% to 0.15% yttrium, the balance being essentially nickel.

4,174,965
PROCESS FOR THE PRODUCTION OF METAL ALLOYS

Kurt Buxmann, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 1, 1978, Ser. No. 901,708
Claims priority, application Switzerland, Jun. 2, 1977, 6766/77
Int. Cl. C22c 1/02
U.S. Cl. 75—135 19 Claims



1. A process for the production of metal alloys which comprises providing a chamber exposed to atmospheric pressure having an inlet and an outlet for the through-flow of molten metal therethrough, said chamber containing therein a bed of heat resistant, exchangeable, inert granular particles filling at least a portion of said chamber to provide a tortuous path through said chamber, passing molten metal through said chamber whereby said molten metal passes through said tortuous path, adding proportioned amounts of alloying additions to the inflowing molten metal, whereby the alloying additions are dissolved in the melt, provided that the components to be mixed are repeatedly divided and united again by the granular particles of the bed which serves as deflection and mixing elements as the melt flows through the bed before leaving the said chamber, wherein the degree of mixing can be changed by altering the size of the particle employed for the granular bed, whereby the melt leaves said chamber intimately mixed.

4,174,966

HIGH COERCIVE FORCE RARE EARTH METAL-COBALT MAGNETS CONTAINING COPPER AND MAGNESIUM

John W. Walkiewicz, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 15, 1978, Ser. No. 969,767
Int. Cl.[2] C22C *19/00*
U.S. Cl. 75—170 8 Claims

1. A magnetic alloy composition, which comprises: an alloy of the formula:

34 to 37 wt.% RE 55.6 to 63.9 wt.% Co 2 to 7 wt.% Cu 0.05 to 0.40 wt.% Mg

wherein RE is mischmetal or a rare earth metal excluding samarium.

4,174,967

TITANIUM CARBIDE TOOL STEEL COMPOSITION FOR HOT-WORK APPLICATION

M. Kumar Mal, Spring Valley, and Stuart E. Tarkan, Monsey, both of N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,910
Int. Cl.[2] B22F *5/00*; C22C *33/02, 38/14, 29/00*
U.S. Cl. 75—237 2 Claims

1. A sintered titanium carbide tool steel composition suitable as die material for hot working applications characterized by an improved combination of resistance to thermal shock, impact and wear and by resistance to softening at elevated temperatures, said sintered composition comprising by weight about 20% to 30% primary grains of titanium carbide dispersed through a steel matrix making up the balance, the composition of said matrix consisting essentially by weight of about 4% to 6% chromium, about 3% to 5% molybdenum, about 3% to 7% nickel, about 0.3% to 0.5% carbon and the balance essentially iron, said matrix surrounding the primary grains of titanium carbide being characterized by a microstructure of an austenitic decomposition product.

2. As an article of manufacture, a hardened wear resistant die element suitable for hot working applications, said element being made of a sintered titanium carbide tool steel composition characterized by an improved combination of resistance to thermal shock, impact and wear and by resistance to softening at elevated temperature, said sintered composition comprising by weight about 20% to 30% primary grains of titanium carbide dispersed through a steel matrix making up the balance, the composition of said matrix consisting essentially by weight of about 4% to 6% chromium, about 3% to 5% molybdenum, about 3% to 7% nickel, about 0.3% to 0.5% carbon and the balance essentially iron, said steel matrix being characterized by a microstructure comprising martensite.

4,174,968

PHOTOGRAPHIC REVERSAL PROCESS WITHOUT SECOND EXPOSURE

Karl Frank, Leverkusen, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,527
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1977, 2700290
Int. Cl.[2] G03C *7/00, 5/50*
U.S. Cl. 430—375 9 Claims

1. In a photographic reversal process for the production of positive photographic images comprising the steps of first imagewise exposure of a light sensitive material comprising at least one silver halide emulsion layer

and then black and white development of said exposed material in a first development,

subsequent to said black and white development treatment of the exposed and developed material

in a preliminary bath with an agent selected from the group consisting of metal ions of metals of the transition elements, hydrazine salts or salts of hydrazine derivatives, hydroxylamine salts or salts of hydroxylamine derivatives, iminoaminomethane sulphinic acid compounds and thiourea dioxide,

and then further treating the material in an alkaline bath,

and subsequently color development of the exposed and developed and treated material by reaction of the color couplers with oxidized color developer, so as to provide the exposed and developed and treated material with chemical fogging after black and white development and before color development.

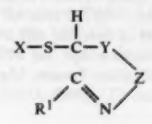
4,174,969

LIGHT SENSITIVE PHOTOGRAPHIC MATERIAL

Heinrich Odenwälder, Cologne, and Erwin Ranz, Leverkusen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 15, 1977, Ser. No. 787,970
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617310
Int. Cl.[2] G03C *7/00, 1/40*
U.S. Cl. 430—445 5 Claims

1. The color photographic development process for the production of multicolored images by exposing a color photographic multilayered material comprising at least one light-sensitive silver halide emulsion layer and in association with it a non-diffusing color coupler and developing the exposed material with a color developer compound in the presence of a thioether DIR compound which when it reacts with the oxidation product of the color developer compound releases a diffusible substance capable of inhibiting the development of silver halide, wherein the improvement comprises the color development is carried out in the presence of a thioether DIR compound of the following formula I



in which

X represents a 5-membered or 6-membered heteroaromatic group having at least one nitrogen atom;

Y represents —O—,

or —S—;

Z represents a —C—C— or —C—N— bond required for completing a 6-membered heterocyclic ring, which may have fused to it a triazole, triazine or benzene ring

R^1 represents an aliphatic, araliphatic or aromatic hydrocarbon group, or acyl and

R^2 represents hydrogen, an aliphatic, araliphatic or aromatic hydrocarbon group, or acyl.

4,174,970

REFRACTORY COMPOSITION

Günter Gelsdorf, Nordenstadt, and Friedhelm Wirth, Siershahn, both of Fed. Rep. of Germany, assignors to Didier-Werke A.G., Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,837
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722903
Int. Cl.[2] C04B *35/56*
U.S. Cl. 106—44 11 Claims

1. In a refractory composition for blast furnace pouring

ducts which comprises: silicon carbide in an amount of 5 to 30% by weight, a predominantly carbon-containing material, refractory components, a binder and water, with or without a plasticizer, the improvement wherein said composition additionally comprises 0.1 to 3% by weight of fine Cr_2O_3 based on the total weight of the dry components.

4,174,971

SILICON CARBIDE BODY CONTAINING A MOLYBDENUM DISILICIDE ALLOY

Nils G. Schrewelius, Hallstahammar, Sweden, assignor to Bulten-Kanthal Aktiebolag, Sweden

Continuation of Ser. No. 749,777, Dec. 13, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,045

Claims priority, application Sweden, Dec. 11, 1975, 7513997

Int. Cl.[2] C04B *35/56, 35/58*

U.S. Cl. 106—44 **3 Claims**

1. A silicon carbide body comprising a skeleton consisting of silicon carbide particles, said skeleton having additional amounts of silicon carbide formed in situ and bonded therein, and resulting from the reaction of a pyrolyzed carbonaceous source and silicon in stoichiometric amounts, thereby providing a body with intercommunicating cavities in which the silicon carbide occupies at least 70% by volume of the body, said cavities being filled entirely by a molybdenum-silicon alloy.

4,174,972

NONFIBROUS CASTABLE REFRACTORY CONCRETE HAVING HIGH DEFLECTION TEMPERATURE AND HIGH COMPRESSIVE STRENGTH AND PROCESS

Michel L. Drouzy, 49 Blvd. Saint-Germain, 75005, Paris; Michel M. Richard, 4 rue Faraday, 75017, Paris; François P. Huet, 10 rue de Marignan, 75008, Paris, and Henri M. Lacau, 29 rue de l'Universite, 75007, Paris, all of France

Continuation-in-part of Ser. No. 689,374, May 24, 1976, abandoned. This application Apr. 20, 1978, Ser. No. 898,194

Claims priority, application France, May 29, 1975, 75 16810

Int. Cl.[2] C04B *35/02*

U.S. Cl. 106—64 **1 Claim**

1. A nonfibrous castable refractory concrete nonwettable by molten aluminum, having a deflection temperature under load above 1000° C. and a compressive strength higher than 1450 Newton/cm^2 comprising grains bound by a hydraulic binder and having a content by weight of aluminum expressed as Al_2O_3 of from 40 to 60%, a content by weight of calcium expressed as CaO of from 4 to 14%, a content by weight of silicon expressed as SiO_2 of from 20 to 60%, a content by weight of sodium, expressed as Na_2O less than 2%, and a fluorine-containing material, consisting of F_2Ca in an amount between 1 and 2% by weight or consisting of a mixture 0.8–1.2% by weight of alkali or alkaline-earth metal fluosilicate and 0.2–0.8% by weight of F_2Ca, said fluorine-containing material being distributed uniformly throughout the mass of said concrete in a solid form.

4,174,973

TRANSPARENT YTTRIA CERAMICS CONTAINING MAGNESIA OR MAGNESIUM ALUMINATE

William H. Rhodes, Lexington, and F. Joseph Reid, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 29, 1979, Ser. No. 7,097

Int. Cl.[2] C04B *35/50*

U.S. Cl. 106—73.2 **5 Claims**

1. A substantially transparent, high density polycrystalline yttria-based body consisting essentially of yttria and about 0.1% to 5% by weight of a material selected from the group consisting of MgO and $MgAl_2O_4$.

4,174,974

PROCESS FOR CONVERTING COAL ASH SLAG INTO PORTLAND CEMENT

F. Frederick Fondriest, Lake Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 14, 1978, Ser. No. 896,354

Int. Cl.[2] C04B *7/14, 7/02*

U.S. Cl. 106—103 **8 Claims**

1. A manufacturing process for converting coal ash slag from a slagging coal gasifier into a marketable cement product having the characteristics and qualities of portland cement, which process comprises the steps of: transferring molten bituminous, semi-bituminous or lignitic noncoking coal slag having a temperature range between approximately 2800° F. and 3600° F. from a slagging coal gasifier to a melt chamber, reacting a preheated mineral containing lime with said slag in the ratio of 1 part slag to 1.2 to 4 parts of said mineral containing lime to form a homogeneous cement product having a temperature range between approximately 2200° F. and 2800° F., transferring said cement product to a quench chamber where said product cools and solidifies in the form of clinkers, and reducing said clinkers to powder form.

4,174,975

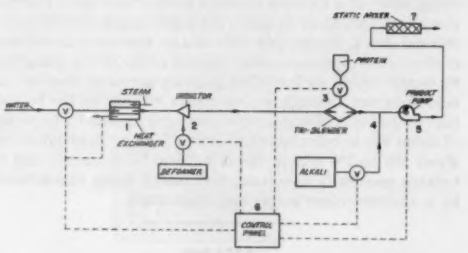
METHOD FOR THE MANUFACTURE OF WATER SOLUBLE ADHESIVES

Thomas W. Daly, Imperial; Ralph A. Hoer, Ballwin; James E. Walsh, and Henry T. James, both of St. Louis, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Sep. 1, 1977, Ser. No. 829,686

Int. Cl.[2] C08L *89/00*

U.S. Cl. 106—161 **4 Claims**



1. An improved method for manufacturing water soluble adhesives, comprising the steps of:

a. heating a continuous flow of water at a rate of from about 90 to 110 BTU/#;

b. subjecting said flow to a venturi flow pattern;

c. injecting through the venturi into the heated flowing water an antifoaming agent at a rate of from 0.01% to 5% of the rate of adhesive solids addition;

d. then subjecting the flowing water to vortex flow mixing conditions.

e. admixing adhesive solids at the point of the vortex flow mixing at a rate of from about 0.25 to 0.33 lbs adhesive solids/# H_2O;

f. then injecting from about 0.026 to 0.044 lbs of an aqueous alkali solution/# H_2O, said alkali solution serving to adjust the pH of the solution to greater than 8.5;

g. and finally subjecting the flow to a static mixing action.

4,174,976

ACID HYDROLYSIS OF CELLULOSE TO YIELD GLUCOSE

George T. Tsao; Michael R. Ladisch, and Arindam Bose, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Mar. 8, 1978, Ser. No. 884,478
Int. Cl.[2] C13K *1/02*
U.S. Cl. 127—37 8 Claims

1. A process for hydrolyzing the cellulose in a cellulosic material to obtain glucose therefrom comprising:

contacting the cellulosic material either with a solvent comprising ethylenediamine, cadmium hydroxide and water or with a solvent comprising a chelating metal caustic swelling agent whereby the solvent dissolves the cellulose to form a solution,

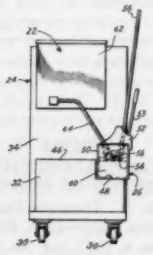
precipitating the cellulose from the solution; and hydrolyzing the precipitated cellulose with acid to obtain glucose.

4,174,977

APPARATUS AND METHOD FOR MOPPING FLOORS

Robert L. Shallenberg, Wheaton; Austen B. Hufton, West Chicago; Roland A. Blomgren, Glen Ellyn, and William M. Copeland, Hoffman Estates, all of Ill., assignors to ServiceMaster Industries, Inc., Downers Grove, Ill.

Filed Mar. 13, 1978, Ser. No. 885,859
Int. Cl.[2] A47L *13/22*; B08B *7/04*
U.S. Cl. 134—6 11 Claims



1. An improved apparatus for rinsing and sanitizing a mop by dispensing a pre-selected volume of "fresh" cleaning solution onto the mop and adapted to be utilized with a conventional mop bucket having a capacity of multiple pre-selected volumes of cleaning solution and having a conventional mop wringer mounted on the upper, open end of the bucket so as to maintain a mop therein out of contact with any cleaning solution in the bucket as a result of normal usage of the apparatus, bucket and mop, said apparatus comprising, in combination:

a reservoir tank defining a reservoir to hold multiple pre-selected volumes of "fresh" cleaning solution;

a metering tank defining a metering chamber to hold a single pre-selected volume of "fresh" cleaning solution;

a dispensing spout for dispensing "fresh" cleaning solution onto the mop when the mop is disposed in the mop wringer; and

valve means for selectively connecting the reservoir in the reservoir tank with the metering chamber in the metering tank so that the metering chamber is filled with "fresh" cleaning solution from the reservoir and for selectively connecting the metering chamber in the metering tank with the dispensing spout so that the pre-selective volume of "fresh" cleaning solution in the metering chamber empties through the dispensing spout onto the mop in the mop wringer.

9. An improved method for rinsing and sanitizing a mop with a pre-selected volume of "fresh" cleaning solution, the mop being used to clean surfaces in cooperation with a conventional mop bucket having a capacity of multiple pre-selected volumes of cleaning solution and having a conventional mop wringer mounted on the upper, open end of the bucket so as to maintain a mop therein out of contact with any cleaning solution in the bucket as a result of normal usage, said method comprising the steps of:

(1) placing the mop in the mop wringer;

(2) wringing any "dirty" cleaning solution from the mop into the mop bucket by actuation of the mop wringer;

(3) dispensing a pre-selected volume of "fresh" cleaning solution onto the mop; and

(4) wringing a portion of said "fresh" cleaning solution into the mop bucket by again actuating the mop wringer so that the mop is partially dry for use in cleaning a surface.

4,174,978

SEMICONDUCTOR PHOTOVOLTAIC GENERATOR AND METHOD OF FABRICATING THEREOF

Nikolai S. Lidorenko, 3 Mytischinskaya ulitsa, 14a, kv. 127; Vladimir M. Evdokimov, Anadyrsky prospekt, 67, kv. 77; Vitaly V. Zadde, poselok Severny, 9 linia, 3, kv. 120; Alexandr I. Kozlov, ulitsa Mikhailova, 5, kv. 66; Stanislav V. Ryabikov, pereulok Vasnetsova, 12, kv. 64; Valery N. Potapov, ulitsa Timiryazevskaya, 13, kv. 213; Dmitry S. Strebkov, ulitsa Luganskaya, 21; Tatiana I. Surianinova, Dmitrovskoe shosse, 25, kv. 113; Boris A. Chubrikov, ulitsa Fedora Poletaeva, 25, kv. 160, all of Moscow; Valentina V. Zatravina, Mytischinsky raion, derevnya Belyaninova, 6, Moskovskaya oblast; Boris V. Korolev, Shenkursky proezd, 8, kv. 208, Moscow; Viktor F. Kulikov, ulitsa Komarova, 11-b, kv. 56, Moscow; Larisa L. Zhuravleva, ulitsa Bochkova, 8, kv. 64, Moscow; Vadim A. Unishkov, ulitsa Bazhova, 15, korpus 1, kv. 162, Moscow; Anatoly A. Dormidontov, ulitsa Marii Ulianovoi, 11, kv. 93, Moscow; Viktor I. Moiseev, 3 Mytischinskaya ulitsa, 14-a, kv. 74, Moscow, and Ljubov P. Kudeshova, Studeny proezd, 38, korpus 2, kv. 391, Moscow, all of U.S.S.R.

Filed May 11, 1978, Ser. No. 904,860
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 PC 8 Claims

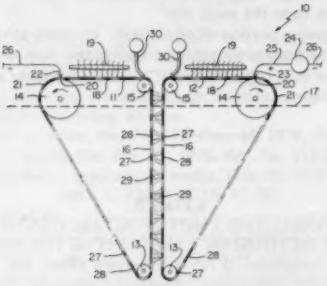
1. A semiconductor photovoltaic generator comprising: a plurality of semiconductor photovoltaic converters, a p-n junction in each of said photovoltaic converters located between a base region and an inverse region of each said photovoltaic converter; a plurality of current-collecting contact pairs, the number of which is equal to the number of said photovoltaic converters, said contacts being located individually on opposite sides of said photovoltaic converters and interconnecting said photovoltaic converters in series to form a monolithic structure; a photoactive face of said generator made as a staircase-type structure and having a plurality of steps, each step having a width that is about equal to, but does not exceed, the diffusion distance of minority carriers in the base region, said steps each having an area which is inversely proportional to the power of incident radiation received by it, transverse parallel grooves being made in the surfaces of said steps, the distance between the crests of said adjacent grooves not exceeding the diffusion distance of minority carriers in said base region, said p-n junction following the contour of the surface of said steps.

4,174,979

METHOD OF STORING SOLAR ENERGY

James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Filed Apr. 10, 1978, Ser. No. 894,827
Int. Cl.[2] H01L *35/00*; B03C *5/00*
U.S. Cl. 136—206 **10 Claims**



1. A method of storing solar energy in the immediate vicinity of available solar energy comprising the steps of providing a strip of electret producing material, and changing said strip of material into a strip of electret means directly with said available solar energy so that said available solar energy need not be transmitted other than by said electret means, said changing step comprising the step of forming at least one side of said strip of electret means with a repeating serial pattern of a narrow band of electret means transversely across said strip of material and then a wide band of electret means transversely across said strip of material that is spaced from said narrow band of electret means whereby said strip of electret means has each pair of adjacent narrow bands of electret means thereof separated by a wide band of electret means thereof disposed therebetween and spaced therefrom, said forming step comprising the step of causing said bands of said electret means to all have a negative charge or all have a positive charge at said one side of said strip of material.

4,174,980

MELAMINE-FORMALDEHYDE AND TANNIN TREATMENT OF METAL SURFACES

John K. Howell, Jr., North Branch, and Leonard Kulick, Ferndale, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 736,278, Oct. 27, 1976, abandoned, which is a continuation of Ser. No. 518,017, Oct. 25, 1974, abandoned. This application Jul. 24, 1978, Ser. No. 927,421
Int. Cl.[2] C23F *7/00*
U.S. Cl. 148—6.14 R **6 Claims**

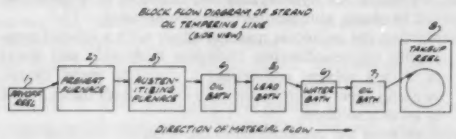
1. A process for treating a bare aluminum surface to impart improved corrosion resistance and adhesion of subsequently-applied paint comprising contacting the surface with a chromium-free aqueous composition exhibiting a pH value of from 8 to 11 and containing at least 0.01 g/l of a melamine-formaldehyde resin and at least 0.01 g/l of a vegetable tannin in a weight ratio of resin:tannin of 1:30 to 30:1 and thereafter drying the composition on the surface to yield a coating weight, of from 1 to 400 mg/ft^2.

4,174,981

METHOD OF MANUFACTURING SPRINGS, INCLUDING THE PRODUCTION OF ROD THEREFOR

Ralph M. Cassell, Florissant, Mo., assignor to Laclede Steel Company, St. Louis, Miss.

Filed Feb. 6, 1978, Ser. No. 875,151
Int. Cl.[2] C21D *1/80, 9/52, 9/56*
U.S. Cl. 148—12 B **6 Claims**



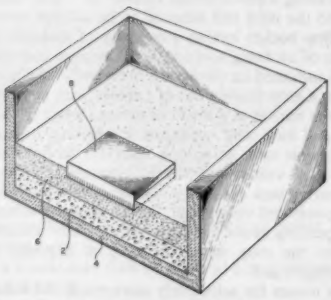
1. The method of producing rod particularly suitable for the manufacture of cold wound coiled springs comprising forming round steel rod by hot rolling with the gauge of the rod within a tolerance of ±0.010 inch and the rod not out of round more than 0.015 inch, oil tempering the rod as produced in the hot rolling operation, without drawing the rod, by passing it through an austenitizing step, an oil quenching step, and a tempering step, and coiling the resultant oil tempered rod.

4,174,982

CAPLESS ANNEALING COMPOUND SEMICONDUCTORS

Anthony A. Immorlica, Jr., Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 6, 1977, Ser. No. 803,501
Int. Cl.[2] C22F *1/02*
U.S. Cl. 148—13.1 **10 Claims**



1. A method of annealing a compound semiconductor comprising:

placing an inert solid material in loose physical contact with a surface of the semiconductor to be protected;

placing said inert material and semiconductor in a controlled atmosphere;

heating said semiconductor to an annealing temperature;

maintaining said semiconductor at said annealing temperature to anneal said semiconductor;

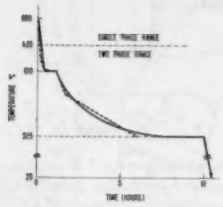
cooling said semiconductor; and

removing said semiconductor from said controlled atmosphere and from said inert material.

4,174,983
FE-CR-CO MAGNETIC ALLOY PROCESSING

Gilbert Y. Chin, Berkeley Heights; Sungho Jin, Meyersville; John T. Plewes, Berkeley Heights, and Bud C. Wonsiewicz, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 13, 1978, Ser. No. 924,137
Int. Cl.[2] H01F *1/02*
U.S. Cl. 148—102 18 Claims

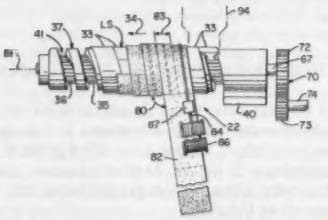


1. Method for producing a magnetic metallic body by an aging treatment of an alloy of which an aggregate amount of at least 95 weight percent consists of Fe, Cr, and Co, said aggregate amount having a Cr content in the range of 20–35 weight percent and a Co content in the range of 5–25 weight percent CHARACTERIZED IN THAT said aging treatment comprises the steps of (1) maintaining said alloy at a first temperature corresponding to an essentially single phase alpha state so as to produce in said alloy an essentially single phase alpha structure, (2) lowering the temperature of said alloy from said first temperature to a second temperature in the range of 585°–625° C. at a rate which over essentially the entire range of temperatures between said first temperature and said second temperature is in the range of 60°–650° C./h, and (3) lowering the temperature of said alloy from said second temperature to a third temperature in the range of 500°–550° C. at a rate which over essentially the entire range of temperatures between said second temperature and said third temperature is in the range of 2°–30° C./h. **20**

4,174,984
MACHINE FOR AND METHOD OF MAKING TUBULAR CONDUIT OF INDEFINITE LENGTH

Roger D. Meadows, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Oct. 2, 1978, Ser. No. 948,067
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—143 20 Claims

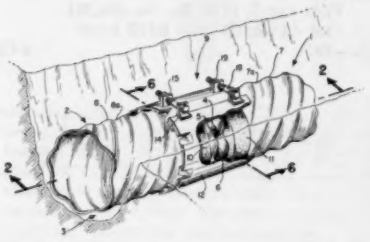


1. In a machine for making a substantially smooth inside surface tubular conduit of indefinite length comprising; an elongate mandrel supported at one end and unsupported at its opposite end; apparatus carried by said mandrel and being rotatably and axially movable therealong between said opposite ends, said apparatus being adapted to support material wound thereon to define a length of said tubular conduit and moving out of supporting relation once said length of tubular conduit moves axially beyond said opposite end; the improvement wherein said mandrel comprises a rotatable central part, a helical structure supported in a cantilevered manner at said one end and at a fixed position concentrically around said central part with said central part being rotatable therewithin, said helical structure defining a helical groove along said mandrel, and a plurality of members defining said apparatus, each of said members having a portion extending within said helical groove and being operatively connected to said central part and movable by said central part along said helical groove in the helical path defined thereby with rotation of said central part, said members being adapted to support said material thereon and moving out of said supporting relation by falling by gravity within said length of tubular conduit at said opposite end.

4,174,985
PROCESS FOR MANUFACTURING COUPLING GASKETS FOR HELICALLY CORRUGATED SPIRAL PIPE

Kirby J. Buidry, P.O. Box 14386, Baton Rouge, La. 70808

Division of Ser. No. 760,702, Jan. 19, 1977, Pat. No. 4,124,236. This application Aug. 22, 1978, Ser. No. 935,869
Int. Cl.[2] B29F *1/00, 3/00*
U.S. Cl. 156—244.18 4 Claims



1. A process for manufacturing flexible helically corrugated gaskets for use in a coupling for providing a substantially soil tight joint between abutting ends of helically corrugated pipe which comprises:

(a) forming a sheet constructed of flexible material and having parallel annular-type corrugations having a similar pitch and depth similar to the corrugation of said pipe,

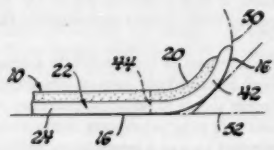
(b) angularly cutting said sheet across said corrugations to form a strip, said angular cut being approximately identical to the complement of the helical angle of said pipe, and

(c) permanently attaching the opposite ends of said strip to one another.

4,174,986
METHOD OF FORMING A FLEXIBLE TAPERED END FOR AN EXTRUDED PLASTIC MOLDING STRIP

Robert E. Jennings, Bayville, N.J., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1978, Ser. No. 885,753
Int. Cl.[2] B32B *31/18*
U.S. Cl. 156—160 3 Claims



1. A method of forming a taper on an end portion of a molded plastic strip comprising the steps of

removing a V-shaped piece from said end portion of said strip to form generally triangular shaped legs, as viewed at the top, said legs being adjacent to the apex of the V,

bending said legs in an upward direction as said strip is viewed from the top such that their bottom surfaces are stretched and, while said legs are bent, drawing them together in line contact as viewed at said top and bottom surfaces to form said taper, said line extending from said apex to the tip of the newly formed taper, and bonding said legs together along a portion of said line at the tip of the taper remote from the apex, and thereafter

forming a series of spaced cuts in the tapered end of said strip through its bottom surface in a direction substantially perpendicular to the said contact line.

4,174,987

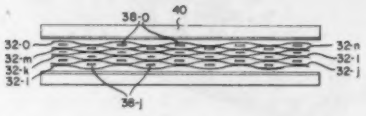
METHOD OF MAKING HEAT EXCHANGE STRUCTURE

David S. Belvin, Seattle; Clifford R. Perry, Renton, and Dale F. Watkins, Sumner, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 7, 1978, Ser. No. 894,251

Int. Cl.[2] B31D *3/02*; B32B *31/00*

U.S. Cl. 156—197 **8 Claims**



1. A method of forming a structure particularly adapted for use as a heat exchange structure providing a plurality of heat exchange passageways, said structure being a longitudinal axis, a lateral axis and a vertical axis, said structure comprising:

a. a plurality of thin film heat sealable plastic sheets aligned longitudinally and laterally with one another and spaced vertically from one another,

b. alternate pairs of said sheets being bonded one to another along a plurality of first longitudinally extending bond lines, positioned at predetermined laterally spaced first locations across said sheets,

c. intermediate pairs of said sheets being bonded one to another along a plurality of second longitudinally extending bond lines positioned at laterally spaced second locations across said sheets, said second bond lines being positioned transversely intermediate of said first locations, each of said intermediate pairs of sheets being made up of adjacent sheets of alternate pairs of said sheets,

said method comprising:

a. placing a plurality of thin film heat sealable plastic sheets, which are to form the heat exchange structure, adjacent one another in both longitudinal and transverse alignment, and in vertically stacked relationship,

b. placing a first set of bonding bars between alternate pairs of said sheets at first locations where the first longitudinally extending bond lines of said alternate sheets are to be located,

c. placing a second set of longitudinally extending bonding bars between intermediate pairs of said sheets being made up of adjacent sheets of adjacent alternate pair of sheets,

d. causing said bars to be in pressure contact with said sheets and heating said bars to a temperature sufficiently high to cause bonding of said sheets to one another at the locations of the first and second longitudinally extending bond lines, and

e. removing the bars from the sheets.

4,174,988

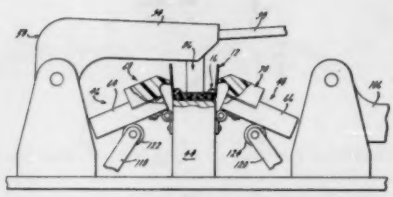
METHOD AND APPARATUS FOR MAKING PADDED STRAPS

Ronald D. Moore, Grosse Pointe, and Everett L. Bethel, Sterling Heights, both of Mich., assignors to Chivas Products Ltd., Warren, Mich.

Continuation of Ser. No. 653,669, Jan. 30, 1976, abandoned. This application Aug. 31, 1977, Ser. No. 829,227

Int. Cl.[2] B29C *17/04*

U.S. Cl. 156—213 **49 Claims**



1. A method for making a padded strap having a strap member, a cushion member, a cover having opposite edge portions, and a flexible shoulder member having shoulders at opposite edge portions comprising

positioning said cushion member on said cover, said strap member on said cushion member, and said shoulder member with respect to the other of said members so that said cushion member and said cover are disposed on one side of said strap member, said opposite edge portions of said cover extend laterally outwardly of said cushion member and said strap member, and said shoulders of said shoulder member are disposed so as to extend above the side of said strap member opposite said one side;

applying a force to the side of said strap member opposite said one side to compress said cushion member;

wrapping said cover about said cushion member, said strap member, and said shoulders while said cushion member is compressed so that said opposite edge portions are disposed on said opposite side of said strap member;

engaging said cover on said opposite side of said strap member at said shoulders in a manner to independently restrain each of said shoulders from movement in either direction laterally of said strap to substantially prevent positional change of said shoulders through flexing of said flexible shoulder member but leaving said opposite edge portions of said cover exposed while maintaining said cushion member at least partially compressed; and

joining said edge portions while said cushion member is at least partially compressed.

4,174,989

METHOD OF FABRICATING DOUBLE-CURVATURE SHELLS

Mikhail G. Skakunov, ulitsa Zelenaya, 6, kv. 60, Levoberezhnaya Moskovskoi oblasti; Konstantin K. Lipodat, 2nd Samotechny pereulok, 4, korpus 1, kv. 37; Leonid V. Karasev, 1st Radiatorskaya 3, kv. 62, both of Moscow, and Vilgelm V. Modzelevsky, ulitsa Molodogvardeiskaya, 225, kv. 106, Kuibyshev, all of U.S.S.R.

Filed Jun. 21, 1978, Ser. No. 917,517

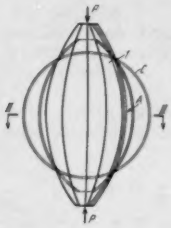
Claims priority, application U.S.S.R., Sep. 27, 1977, 2522319[I]

Int. Cl.[2] B65C *3/26*

U.S. Cl. 156—156 **5 Claims**

1. A method of fabricating double-curvature shells from meridional petaloid sections wherein said meridional petaloid sections prefabricated from a flexible material are consecutively joined with one another in a number required for making said shell; said meridional petaloid sections are consecutively coiled into a spindle-shaped roll in the process of joining said sections so that said sections are pre-curved in the lateral and

longitudinal directions, said spindle-shaped roll being adapted for storage and transportation; said roll is subsequently uncoiled and curved in the longitudinal and lateral directions by



applying an axial force to at least one of the ends of said spindle-shaped roll, thus forming a double-curvature shell; and the first and the last of said sections are thereafter joined with each other.

4,174,990

HEAT AND SOLVENT RESISTANT FLEXIBLE GASKET MEANS AND PROCESS FOR PRODUCTION THEREOF

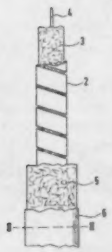
Herbert Meister, Langnau, Switzerland, assignor to Herbert Meister and Co., Zurich, Switzerland

Division of Ser. No. 798,167, May 18, 1977, Pat. No. 4,119,323. This application May 15, 1978, Ser. No. 906,024

Claims priority, application Switzerland, May 18, 1976, 6222/76

Int. Cl.[2] **B65H** *69/02*

U.S. Cl. 156—158 **7 Claims**



1. A process of forming a substantially heat and solvent resistant gasket sealing means comprising the steps of

(a) compacting fibrous material around a metallic core;

(b) impregnating said core with a binding material whereby said fibrous material adheres substantially and inseparably to said metallic core to form a composite core;

(c) surrounding said composite core with a flexible substantially helical metallic winding;

(d) winding fibrous material in woven form around said metallic winding to provide a fibrous sheath therefor;

(e) impregnating the said fibrous sheath with a substantially heat and solvent resistant polymeric material in an amount sufficient to provide an envelope having a smooth surface.

4,174,991

PROCESS OF LAMINATING CARPET TO ELASTOMERIC BACKING

Harold Reuben, Akron, Ohio, assignor to The Akro Corporation, Canton, Ohio

Filed Nov. 13, 1978, Ser. No. 959,727

Int. Cl.[2] **B29C** *19/00*

U.S. Cl. 156—242 **16 Claims**

1. A method of laminating a curable elastomeric backing section having a first surface and a second surface to a heat deformable pile carpet section having a first surface, a second surface, and a carpet pile adjacent to the second surface of the carpet section, comprising:

contacting the second surface of the curable elastomeric backing section to the first surface of the pile carpet section,

placing the curable elastomeric backing section and pile carpet section under a compressive molding pressure of at least 50 psi applied to the first surface of the curable elastomeric backing section and the second surface of the pile carpet section,

crushing the carpet pile while the curable elastomeric backing section and pile carpet section are under the compressive molding pressure,

embedding a portion of the first surface of the pile carpet section in the second surface of the curable elastomeric backing section,

heating the curable elastomeric backing section to set the elastomeric backing simultaneously while the pile carpet section and the curable elastomeric backing section are under the compressive molding pressure,

cooling the pile carpet section to maintain the carpet pile below a temperature at which the carpet pile becomes substantially permanently deformed under the applied molding pressure so as to maintain the resiliency of the carpet pile upon release of the compressive molding pressure, the cooling being conducted simultaneously while the carpet and backing are under pressure, and

maintaining the heating of the curable elastomeric backing section until the elastomeric backing is set.

4,174,992

WATER PROOFING COMPOSITIONS FOR CEMENT MORTAR OR CONCRETE AND METHODS OF APPLICATION THEREFOR

Toshihiro Fujii, Fukuyama, and Sekiji Yokota, Fukayasu, both of Japan, assignors to Hayakawa Rubber Company Limited, Fukuyama, Japan

Division of Ser. No. 846,051, Oct. 27, 1977, which is a continuation of Ser. No. 668,114, Mar. 18, 1976, abandoned, which is a continuation of Ser. No. 537,014, Dec. 27, 1974, abandoned. This application Jul. 27, 1978, Ser. No. 928,656

Claims priority, application Japan, Jun. 15, 1974, 49-68453

Int. Cl.[2] **B29F** *1/00*

U.S. Cl. 156—244.11 **4 Claims**

1. A method of water-proofing cement mortar and concrete comprising the steps of making a homogeneous mixture consisting essentially of 5–14% by weight of reclaimed butyl rubber, 50–60% by weight filler, 15–20% by weight of at least one of a thermoplastic synthetic resin and a low molecular weight polymer of isobutylene, and 10–20% by weight of a solvent and a softener; and injecting said mixture into engagement with said cement mortar or concrete.

4. A water-proofing composition to be used in contact with wet cement mortar or wet concrete and having adhesion to the wet cement mortar or wet concrete without employing additional bonding materials and a consistency (JIS K2530 penetrometer) at 25° C. of 200–400, which consists essentially of

5–14% by weight of reclaimed butyl rubber, 50–60% by weight of a filler, 15–20% by weight of at least one of a thermoplastic synthetic resin and a low molecular weight polymer of isobutylene, 10–20% by weight of a solvent and a softener.

4,174,993

WATER PROOFING COMPOSITIONS FOR CEMENT MORTAR OR CONCRETE AND METHODS OF APPLICATION THEREFOR

Toshihiro Fujii, Fukuyama, and Sekiji Yokota, Fukayasu, both of Japan, assignors to Hayakawa Rubber Company Limited, Fukuyama, Japan

Division of Ser. No. 846,051, Oct. 27, 1977, which is a continuation of Ser. No. 668,114, Mar. 18, 1976, abandoned, which is a continuation of Ser. No. 537,014, Dec. 27, 1974, abandoned. This application Jul. 27, 1978, Ser. No. 928,657
Claims priority, application Japan, Jun. 15, 1974, 49-68453
Int. Cl.[2] B29F *3/01*
U.S. Cl. 156—244.11 **4 Claims**

1. A method of water-proofing cement mortar and concrete comprising the steps of making a homogeneous mixture consisting essentially of 35–15% by weight of reclaimed butyl rubber, 40–50% by weight filler, 20–35% by weight of at least one of a thermoplastic synthetic resin and a low molecular weight isobutylene polymer and a softener; molding said mixture by extrusion into a desired shape; and placing said shape into engagement with said cement mortar or concrete.

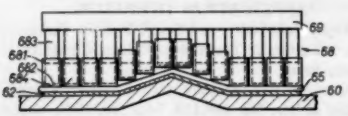
4. A water-proofing composition to be used in contact with wet cement mortar or wet concrete and having adhesion to the wet cement mortar or wet concrete without employing additional bonding materials and a consistency (JIS K2530 penetrometer) at 25° C. of 50–100, which consists essentially of 35–15% by weight of reclaimed butyl rubber, 40–50% by weight of a filler, 20–35% by weight of at least one of a thermoplastic synthetic resin and a low molecular weight of isobutylene polymer and a softener.

4,174,994

APPARATUS FOR METAL COATINGS

Leonardus J. Savelkouls, Bergweg Zuid 159, Bergschenhoek, Netherlands

Division of Ser. No. 844,525, Oct. 25, 1977, Pat. No. 4,101,356. This application Mar. 30, 1978, Ser. No. 891,901
Claims priority, application Netherlands, Nov. 5, 1976, 7612325
Int. Cl.[2] B32B *31/00*; H05B *5/00*
U.S. Cl. 156—380 **3 Claims**



1. An apparatus for use in a process of continuously coating a metal substrate with an organic polymer composition by providing a polymer stratum including a melt bonding composition in a contacting relation with said metal substrate, heating said substrate by means of electromagnetic radiation capable of heating said substrate, and subsequently cooling said metal substrate so as to form a strong interbonding connection between said melt bonding composition and said metal substrate; said apparatus comprising a first means for generating electromagnetic radiation having a frequency in the radio frequency range and a second means for emitting said radiation and in operative connection with said first means;

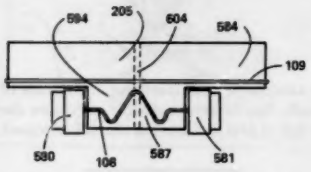
said second means comprising a flexibly-deformable inductor loop for directing said radiation through said polymer stratum onto said metal substrate; and means for deformably pressing said inductor loop onto said polymer stratum to substantially conform said inductor loop and said polymer stratum with a non-planar portion of said metal substrate.

4,174,995

SEVERING AND SEALING TOOL

Sammy J. Ferguson. Dallas, and William R. Yohe, Garland, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Feb. 22, 1978, Ser. No. 879,971
Int. Cl.[2] B32B *31/00*; B30B *15/34*
U.S. Cl. 156—494 **8 Claims**



1. Tool for severing and sealing a plastic strap of a certain width, said strap having one end in contact with an object, and extending about said object and over said one end to form an overlapping portion of said strap adjacent said one end, said overlapping portion including an inner layer in contact with said object and an outer layer in contact with said inner layer, said strap extending from said overlapping portion to another opposite end to said one end thereof adjacent a supply of said strap, comprising:

a body including a flat head to contact said outer layer of said overlapping portion within a predetermined area of said head;

a first resistive wire heating element extending across said predetermined area and having a length at least said certain width;

a second resistive wire heating element extending meanderously within said predetermined area disposed between said first heating element and said one end, when said head contacts said outer layer;

a power source for selectively supplying electricity to said first and second heating elements when said head is in contact with said outer layer to soften portions of said outer layer adjacent said first and second heating elements;

a tension means coupled to said strap intermediate said overlapping portion and said another end providing tension on said strap about said object for pulling the portion of said strap adjacent said first heating element toward said another end away from said overlapping portion to sever said strap after said first heating element softens the portion of said outer layer adjacent said first heating element; and

a switch connected to deactuate said power source after said tension means severs said strap.

4,174,996

PIPE JOINTING

John Hunter, 63 Osborne Rd., Kiveton Park, Near Sheffield, England

Continuation-in-part of Ser. No. 620,289, Oct. 7, 1975, abandoned. This application Dec. 21, 1977, Ser. No. 862,984
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—499 **13 Claims**

1. An apparatus for jointing together by socket fusion two plastics pipe lengths, or one plastics pipe length and a plastics fitting, comprising:

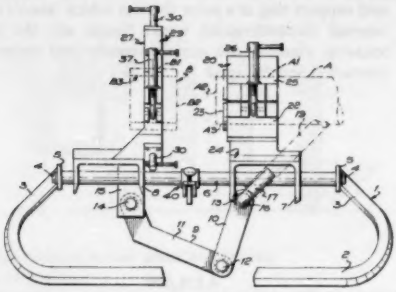
a frame;

first and second ring clamps each slidably mounted on said frame so as to be movable towards or away from one another;

means to effect movement of said clamps relatively toward and away from one another;

said first clamp being dimensioned to clamp one end of a first pipe length and squeeze said end into a predetermined shape;

said second clamp being dimensioned to clamp a fitting, or a socket end of a second spigot and socket pipe length, and said second clamp including a plurality of arcuate bearing shoes circumferentially separated from each other with each being operable on independently of the others by one



of a plurality of screw adjusters carried by said second clamp, said bearing shoes together being adapted to make circumferential contact over substantially the whole of the periphery of said fitting or said socket end, said screw adjusters being adjustable to cause axial alignment of said fitting with respect to said end of said first pipe length, or of said socket end with respect to said end of said first pipe length; and

a heating means for bringing surfaces to be fused together to fusion temperature.

4,174,997

METHOD AND APPARATUS FOR CONTINUOUS HYDROLYSIS OF CELLULOSIC FIBER MATERIAL

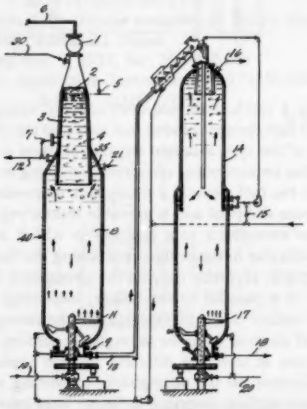
Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed Aug. 26, 1974, Ser. No. 500,900

Claims priority, application Sweden, Sep. 3, 1973, 11940

Int. Cl.[2] D21C *1/02, 1/04, 3/02, 3/24*

U.S. Cl. 162—19 **8 Claims**



1. A method for continuously treating cellulosic fiber material containing a dry substance utilizing a first vertical vessel having an upper steam phase and lower liquid phase, and utilizing a second vertical vessel operatively connected to the first vessel said method comprising the steps of

(a) feeding cellulosic fiber material into the upper steam phase of the first vessel so that the material is heated to hydrolysis temperature,

(b) concurrently impregnating and hydrolizing the material as it moves downwardly in the first vessel in a concurrent liquid phase,

(c) subjecting the downwardly moving material to a countercurrent wash liquid heated to hydrolysis temperature, to purge the dry substance therefrom, in a countercurrent liquid phase,

(d) extracting and recovering from the first vessel hydrolysate containing the dry substance at a portion of the first vessel generally corresponding to the area between the concurrent and countercurrent liquid phases,

(e) discharging the fiber material substantially free of hydrolysate from the first vessel and feeding it to a top portion of the second vessel,

(f) digesting the fiber material by subjecting the downflowing fiber material in the second vessel to counter-current digesting liquor flow,

(g) extracting and recovering black liquor from the second vessel and maintaining it separate and distinct from the hydrolysate extracted from the first vessel, and

(h) removing digested fiber material from the bottom of the second vessel.

7. Apparatus for the hydrolysis of fiber material containing a dry substance, comprising

a first vertical vessel having an upper steam phase and lower liquid phases,

a second vertical vessel,

a transfer line connecting the bottom of said first vessel to the top of said second vessel,

means for feeding cellulosic fiber material into the upper steam phase of said first vessel so that the material is heated to hydrolysis temperature,

means located adjacent the bottom of said first vessel for introducing wash liquid heated to hydrolysis temperature into said first vessel with an upwardly directed velocity component to counter wash and hydrolize the downwardly moving fiber material and purge the dry substance therefrom,

means for recovering from said first vessel the hydrolysate, containing the dry substance, at an intermediate portion of said vertical first vessel,

means for discharging the fiber material, substantially free of hydrolysate, from the bottom of said first vessel into said transfer line,

means for feeding the fiber material from said transfer line into said second vessel,

means for subjecting the downflowing fiber material in said second vessel to a countercurrent digesting liquor flow,

means for extracting and recovering black liquor from said second vessel and maintainint it separate and distinct from the hydrolysate extracted from said first vessel, and

means for removing digested fiber material from the bottom of said second vessel.

4,174,998

PREFLOCCULATED FILLER COMPOSITIONS FOR USE IN THE MANUFACTURE OF PAPER

Leslie E. Shiel, Gravesend, England, assignor to The Associated Portland Cement Manufacturers Limited, London, England

Continuation of Ser. No. 628,791, Nov. 4, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,779

Claims priority, application United Kingdom, Nov. 15, 1974, 49657/74

Int. Cl.[2] D21D *3/00*

U.S. Cl. 162—168 N **15 Claims**

1. A flocculated, aqueous filler composition for use in paper furnish, which comprises water, a pigment, a water soluble starch phosphate selected from the group consisting of starch

monoesters of a phosphoric acid, starch diesters of a phosphoric acid and salts thereof, said starch phosphate having a DS of at least 0.002 in terms of bound phosphorous, and an organic polymeric papermaking retention material having the effect of rendering the filler composition flocculent in the aqueous composition, said organic polymeric material being selected from the group consisting of polyacrylamide and polyamide retention aids, said starch phosphate plus said organic polymeric material being present in amount of 0.1–20% by weight of said pigment and said organic polymeric material being present in amount of 0.1–25% of based upon the combined weights of said starch phosphate plus said organic polymeric material, said starch phosphate and said organic polymeric material interacting to increase their substantiveness to papermaking fibers thereby to increase the retention of said pigment.

14. The method of incorporating chalk whiting as filler in the manufacture of paper, which comprises the steps of:

(a) forming a preflocculated filler in an aqueous medium by dispersing chalk whiting in water in the presence of about 4% by weight based on the chalk whiting of a water soluble starch phosphate having a DS of from 0.002–1.0% of bound phosphorous and about 0.4% by weight based on the chalk whiting of an anionic polyacrylamide retention aid; and then

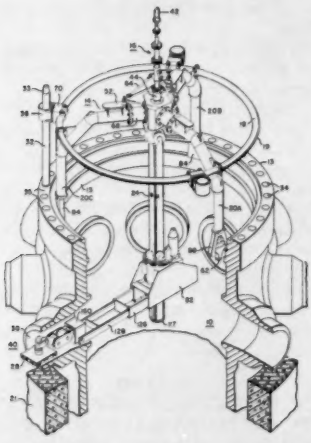
(b) adding said preflocculated filler to a paper furnish having a 2 percent consistency and containing 50% bleached softwood and 50% bleached hardwood beaten to a Schopper-Riegler degree of 25 and sized with rosin and alum.

4,174,999

POSITIONING MEANS FOR CIRCUMFERENTIALLY LOCATING INSPECTION APPARATUS IN A NUCLEAR REACTOR VESSEL

David C. Burns, Trafford, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,403
Int. Cl.[2] G21C *17/00*
U.S. Cl. 176—19 R **19 Claims**



1. Apparatus for locating an inspection device within a nuclear reactor vessel for volumetric examination thereof, the vessel having an external flange having located thereon a plurality of guide studs extending upwardly therefrom defining a generally circular path, an internal locating element the exact position of which is known and an internal circumferential flange, said apparatus comprising:

(a) a support ring generally sized to relate to the path defined by the position of the guide studs;

(b) a plurality of guide stud bushings, equal in quantity to the number of guide studs, said bushings being larger in internal diameter than the outer diameter of the guide studs;

(c) first clamping means for movably mounting said bushings on said support ring to enable, when loosened, alignment of each of said bushings with one of said guide studs;

(d) at least three support legs, all but one of said support legs including means for adapting said legs to contact and rest upon the internal circumferential vessel flange, the remaining support leg including means for adapting said leg to engage the internal locating element; and

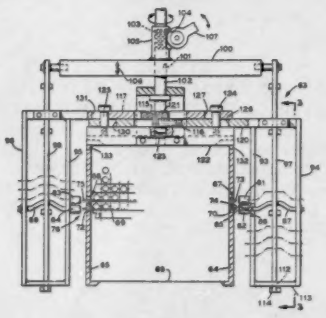
(e) second clamping means for mounting said support legs to said support ring at a point thereon which insures that the internal circumferential vessel flange and the internal locating element are simultaneously and respectively contacted and engaged.

4,175,000

METHOD FOR INSPECTING NUCLEAR REACTOR FUEL ELEMENTS

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 563,030, Mar. 28, 1975, Pat. No. 4,058,224, which is a division of Ser. No. 408,767, Oct. 23, 1973, Pat. No. 3,894,327. This application Aug. 29, 1977, Ser. No. 830,730
Int. Cl.[2] G21C *17/00*
U.S. Cl. 176—19 R **2 Claims**



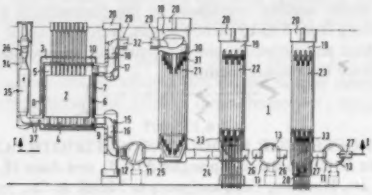
1. In a method of non-destructively inspecting a nuclear reactor fuel element having fuel rods and transversely disposed grids, of the type wherein the fuel element is submerged in a pool, the improvement comprising: moving to a position adjacent to the fuel element a strongback suspended from a bridge that spans the pool and is movable therealong; pivotally moving the strongback to a position in which it is substantially perpendicular to the bridge; positioning the fuel element on the strongback; pivotally moving the strongback into a position in which it is parallel to the bridge; inspecting at least one exposed surface of the fuel element on the strongback; removing the fuel element from the strongback; turning the fuel element to expose at least one different surface; replacing the turned fuel element on the strongback; inspecting said at least one different surface; inserting deflector bars into the grids of the fuel element; rotating the bars to bear against portions of the grids thereby to release the holding engagement between the fuel rods and the grids; withdrawing the fuel rods from the grids; and inspecting at least one of the withdrawn rods.

4,175,001

GAS TURBINE POWER PLANT WITH CLOSED GAS CIRCUIT

Dirk Haferkamp; Alija Hodzic, and Karl-Uwe Schneider, all of Mannheim, Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,204
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639877
Int. Cl.[2] G21C *19/28*
U.S. Cl. 176—60 22 Claims



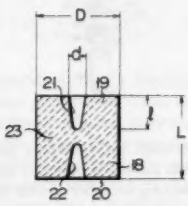
1. A gas turbine power plant comprising:
a pressure vessel;
a nuclear reactor as a heat source housed within a cavity in said pressure vessel;
a gas turbine assembly housed within said pressure vessel having a gas turbine, means for compressing circuit gas and means for recuperative heat exchange;
a thermal barrier within said cavity in said pressure vessel and defining an area surrounding said nuclear reactor;
a sealing liner within said pressure vessel sealing said cavity, surrounding said thermal barrier and defining a free space between said thermal barrier and the sealing liner; and
means for circulating cooking gas through said free space comprising a cooling gas inlet conduit joining said high pressure compressor and said free space, and a cooling gas outlet conduit joining said free space and said recuperative heat exchange means, said high pressure compressor releasing the total volume of cooling gas to said free space and said recuperative heat exchange means receiving the total volume of cooling gas after circulation through said free space.

4,175,002

NUCLEAR FUEL PELLET WITH OPPOSITELY BOTTOMED HOLES

Toyoji Wada, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 2, 1977, Ser. No. 830,143
Claims priority, application Japan, Sep. 6, 1976, 51-106368
Int. Cl.[2] G21C *3/04*
U.S. Cl. 176—66 4 Claims



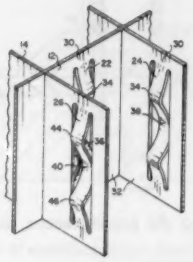
1. A nuclear fuel pellet made of a sintered ceramic nuclear fuel mass and having a cylindrical configuration with a pair of opposite bottomed holes centrally provided one at each end, said bottomed holes being convergent toward their bottoms and each having a U-shaped cross-section, in which a ratio of the diameter of the opening to the depth of the bottomed holes is smaller than unity.

4,175,003

GRID FOR NUCLEAR REACTOR FUEL ASSEMBLIES

Peter H. Beuchel, and Eric G. Cooper, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 23, 1976, Ser. No. 754,050
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—76 4 Claims



1. A grid for a nuclear reactor fuel assembly comprising:
a multiplicity of straps interleaved with each other to form a structure of egg-crate configuration which includes individual cells adapted to contain fuel rods and control rod guide tubes;
a spring projecting inwardly into each cell designated to hold a fuel rod from that portion of each strap which cooperates with the other three strap portion to define the four walls of each cell;
each of said springs being pressed from said strap portion and having its top and bottom ends merging directly into the material of said strap;
each of the four springs projecting inwardly into each cell further being of generally sinusoidal shape and having at least one surface thereon arranged to contact the surface of a fuel rod adapted to extend through a cell;
thereby providing at least a four point resilient support for a fuel adapted to extend through said cell to thereby permit fuel rod axial and radial expansion and contraction without distortion.

4,175,004

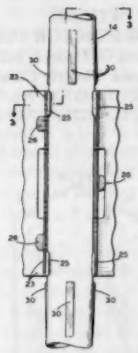
FUEL ASSEMBLY GUIDE TUBE

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,383
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—76 11 Claims

1. In combination with a nuclear fuel assembly of the type having a plurality of vertically extending fuel elements and guide tubes maintained in a laterally spaced array by at least one cellular spacer grid assembly that is composed of a multiplicity of intersecting slotted grid plates disposed to form a plurality of cells through which the fuel elements and guide tubes extend; and, lower and upper end fitting assemblies, each being rigidly attached to the respective ends of the guide tubes, the improvement comprising a plurality of protuberancies integrally formed in the guide tubes in spaced relation, each guide tube having a cross-section at each protuberancy greater than a distance between the plates forming the cell through which the guide tubes extend, the protuberancies being longitudinally aligned with and spaced relative to at least part of of the plates such that the protuberancies engage the plates to restrain longitudinal movements of the spacer grid assembly

relative to the guide tubes beyond the longitudinal spacing, and the spaced relation of the protuberancies being such that the



guide tubes, including the protuberancies, may be inserted through a cell.

4,175,005

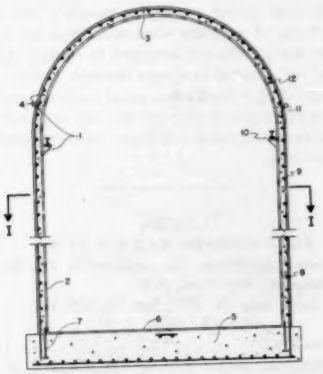
COMPONENT NUCLEAR CONTAINMENT STRUCTURE

Gunnar A. Harstead, 240 Ellin Dr., Park Ridge, N.J. 07656

Continuation of Ser. No. 638,318, Dec. 6, 1975, abandoned. This application Dec. 2, 1977, Ser. No. 856,906

Int. Cl.[2] G21C *13/08*

U.S. Cl. 176—87 **9 Claims**



1. A nuclear reactor containment comprising:

a self-supporting, inner, structural steel, shell-like vessel with curved side walls and top walls having a wall thickness sufficient to enable said steel vessel alone to carry a major portion of the total load imposed on the containment, and, furthermore, sufficient to withstand construction loads imposed upon said vessel during placement of reinforcing and concrete surrounding said vessel,

an outer reinforced concrete vessel surrounding and in direct contact with the steel vessel and carrying the remaining portion of the imposed load,

and a foundation mat, said steel vessel and concrete vessel being supported on said foundation mat,

said steel vessel and said concrete vessel acting together as a composite structure in resisting all applied loads.

4,175,006

COMPOSITION OF MATTER AND PROCESS

Merle G. Wovcha; Frederick J. Antosz, both of Kalamazoo; John M. Beaton, Portage; Alfred B. Garcia, Kalamazoo, and Leo A. Kominek, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 21, 1977, Ser. No. 844,366

Int. Cl.[2] C07B *29/02*

U.S. Cl. 435—55 **11 Claims**

1. A process for preparing 9α-OH testosterone in its essentially pure form which comprises cultivating *Mycobacterium fortuitum* NRRL B-8119 in an aqueous nutrient culture medium under aerobic conditions in the presence of a steroid containing from 8 to 10 carbon atoms, inclusive, in the 17-alkyl side chain and isolating said compound in its essentially pure form from the culture medium.

4,175,007

PROCESS FOR PRODUCING ANTIBIOTIC A21A

Sheldon B. Zimmerman, Springfield, N.J., and John H. Chalmers, Jr., Houston, Tex., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 736,794, Oct. 29, 1976, Pat. No. 4,071,631. This application Nov. 21, 1977, Ser. No. 853,078

Int. Cl.[2] C12D *9/14*

U.S. Cl. 435—105 **6 Claims**

1. A method of producing antibiotic A21A which comprises cultivating a A21A-producing strain of *Streptomyces filipinensis* in a fermentation broth containing assimilable sources of carbohydrates, nitrogen and inorganic salts under aerobic conditions until a substantial amount of A21A is produced in the fermentation broth and recovering said antibiotic.

4,175,008

CULTURE SPECIMEN COLLECTION AND TRANSPORT PACKAGE

Douglas J. White, Nutley, N.J., assignor to Bio-Pharmaceutical Packaging Corp., Clifton, N.J.

Filed Jun. 26, 1978, Ser. No. 919,212

Int. Cl.[2] C12B *1/00*

U.S. Cl. 435—295 **10 Claims**

1. A culture specimen and transport package comprising:

an elongated stem having a first end and a second end;

a specimen collecting member at said first end of said elongated stem;

a first tubular member for sterilizingly housing said specimen collecting member prior to the collection of specimen;

a second tubular member having a culture medium therein for insertion of said specimen collecting member thereinto after collection of a specimen for transport to a test facility;

a first cap member slidably mounted on said elongated stem

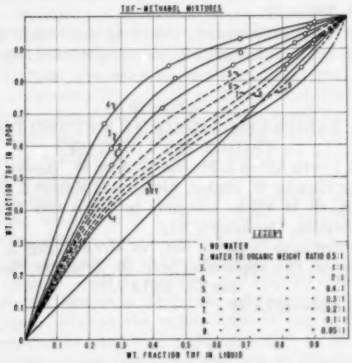
between said first and second ends for sealingly closing said first tubular member when said specimen collecting member is disposed in said first tubular member and for sealingly closing said second tubular member when said specimen collecting member is disposed in said second tubular member, said first cap member being movable between a first position and a second position, said first position providing a relatively long effective distance between said specimen collecting member and said first cap member for specimen collection purposes, and said scond position providing a relatively short effective distance between said specimen collecting member and said first cap member when said specimen collecting member is inserted into said second tubular member after collection of said specimen; and

a second cap member mounted at said second end of said elongated stem for affixing said second tubular member to said elongated stem prior to the collection of a specimen.

4,175,009
SEPARATION OF ALCOHOL FROM TETRAHYDROFURAN

Harry B. Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 15, 1977, Ser. No. 860,788
Int. Cl.[2] C07D *307/00;* B01D *3/40*
U.S. Cl. 203—96 **4 Claims**

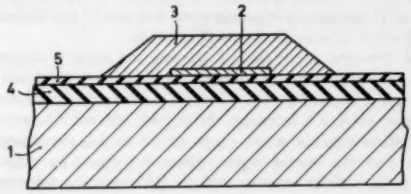

THF–METHANOL MIXTURES
WT. FRACTION THF IN VAPOR
WT. FRACTION THF IN LIQUID
LEGEND
1. NO WATER
2. WATER TO ORGANIC WEIGHT RATIO 0.5:1
3. " " " " " 1:1
4. " " " " " 2:1
5. " " " " " 0.4:1
6. " " " " " 0.3:1
7. " " " " " 0.2:1
8. " " " " " 0.1:1
9. " " " " " 0.05:1

1. A process for separating from a tetrahydrofuran stream comprising one or more aliphatic alcohols selected from the group consisting of methanol, ethanol, isopropanol and tertiary butanol, tetrahydrofuran, optionally water and in the absence of acetone wherein tetrahydrofuran is the major constituent, one or more of said alcohols, said process comprising feeding said tetrahydrofuran stream into a distillation column, extractively distilling said tetrahydrofuran stream in said distillation column by adding water into the distillation column above the feed of said tetrahydrofuran stream at a weight ratio of water to alcohol-tetrahydrofuran of from 0.4:1 to 4:1 and recovering tetrahydrofuran from the top of the column with substantially no alcohol.

4,175,010
METHOD OF REINFORCING A CONDUCTIVE BASE PATTERN BY ELECTROPLATING AND DEVICE OBTAINED BY MEANS OF THE METHOD

Gerrit J. Koel, and Jan Gerkema, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,932
Claims priority, application Netherlands, Apr. 18, 1977, 7704186
Int. Cl.[2] C25D *5/02, 7/12*
U.S. Cl. 204—15 **5 Claims**



1. In a method of manufacturing a device in which an electrically conductive base pattern is formed on a substrate, the surface of which substrate consists of an electrically insulating material, and which conductive base pattern is electroplated so as to form a electrically conductive pattern thereon, the improvement wherein an auxiliary layer having a sheet resistance of between 10^{12} and 10^{17} ohms per square is provided on the electrically insulating surface of said substrate and the electrically conductive base pattern is then formed on said auxiliary layer.

4,175,011
SULFATE-FREE METHOD OF ETCHING COPPER PATTERN ON PRINTED CIRCUIT BOARDS

Nicholas J. Spiliotis, Parsippany, N.J., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Jul. 17, 1978, Ser. No. 925,085
Int. Cl.[2] C25D *5/02;* C23F *1/02;* C09K *13/08*
U.S. Cl. 204—15 **5 Claims**

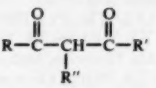
1. In a method of forming printed circuit boards of a type wherein a copper pattern on a board is etched and then a tin/lead layer is plated onto the etched copper pattern, the improvement wherein the etching step consists essentially of contacting the surface with an aqueous etchant solution comprising between about 0.5 and about 70 weight % hydrogen peroxide, between about 2.5 and about 90 weight % fluoboric acid and between about 5 and about 85 weight % water.

4,175,012
β-DIKETONES AND THE USE THEREOF AS METAL EXTRACTANTS

Kenneth D. MacKay, Circle Pines, and Edgar R. Rogier, Minnetonka, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Division of Ser. No. 391,432, Aug. 24, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 641,195
Int. Cl.[2] C25C *1/12;* C01B *3/00, 53/00*
U.S. Cl. 204—108 **22 Claims**

1. The process of extracting divalent metal values selected from copper and nickel from aqueous solutions thereof which comprises contacting the said aqueous solutions with a β-diketone or a solution thereof in an organic hydrocarbon solvent having a boiling point of at least about 150° C. to extract at least a portion of the copper or nickel values in the organic phase, said β-diketone having the structure:



where R is phenyl or alkyl substituted phenyl, R′ is alkyl, alkyl substituted phenyl or chloro substituted phenyl and R″ is H with the provisos that: (1) when R is phenyl, R′ is a branched chain alkyl group of at least seven carbon atoms and (2) when R is alkyl substituted phenyl, the number of carbon atoms in the alkyl substituent or substituents is at least 7 and at least one such alkyl substituent is branched chain.

11. The process of claim **1** wherein the metal is copper, the aqueous solution is ammoniacal, the β-diketone is present in an amount of about 2 to 40% by weight in the organic solvent, the organic solvent is kerosene, the organic solvent solution:aqueous phase ratio is in the range of 5:1 to 1:1, the phases are separated, the loaded organic phase is stripped by contacting the same with an aqueous sulfuric acid stripping solution, the stripped organic phase is separated from the stripping solution and copper metal is recovered from the stripping solution by electrolysis.

4,175,013

METHOD OF GENERATING HYDROGEN AND OXYGEN FROM WATER

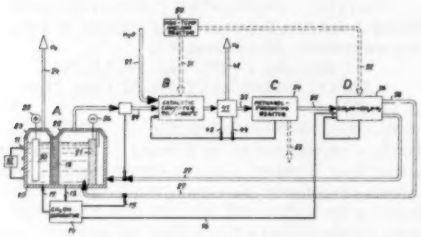
Heiko Barnert; Jiri Divisek, and Wolfgang Faul, all of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,742

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758119

Int. Cl.² C25B *1/04*

U.S. Cl. 204—129 **9 Claims**



1. A method of generating hydrogen and oxygen from water by decomposing water, said method comprising the steps, in combination, of:

(a) electrolyzing an aqueous electrolyte containing 1 to 30% by weight of formaldehyde and having a pH of about 0 to 5 at a temperature of about 50° to 200° C. to produce hydrocarbon gases at a cathode and oxygen at an anode;

(b) converting said hydrocarbon gases and water, while supplying thermal energy, at a temperature of about 700° to 1000° C. to produce a gas stream rich in hydrogen and carbon monoxide;

(c) in an endothermic reaction with abstraction of thermal energy and at a temperature of 250° to 350° C., transforming the gas rich in hydrogen and carbon monoxide to methanol;

(d) transforming the methanol produced in step (c) to formaldehyde and hydrogen and separating the formaldehyde from the hydrogen, the transformation of the methanol to the formaldehyde and hydrogen being effected at a temperature of about 500° to 700° C. with the supply of thermal energy; and

(e) feeding the formaldehyde recovered in step (d) to step (a) for electrolysis in said electrolyte.

4,175,014

CATHODIC DISSOLUTION OF COBALTIC HYDROXIDE

Ranko Crnojevich, Gretna; Edward I. Wiewiorowski, New Orleans, and Peter H. Yu, Harvey, all of La., assignors to AMAX Inc., Greenwich, Conn.

Filed Mar. 6, 1978, Ser. No. 883,378

Int. Cl.² C25C *1/08*

U.S. Cl. 204—130 **7 Claims**

1. In the recovery of cobalt from cobalt-containing nickel solutions, wherein cobalt is separated from said solution as a precipitate containing cobaltic hydroxide, the improved method of dissolving said precipitate for the subsequent recovery of cobalt therefrom by reduction of trivalent metal in said precipitate to the divalent state which comprises,

forming an aqueous slurry of said precipitate acidified with sulfuric acid to a pH ranging from about 0.1 to 2,

subjecting the precipitate of said aqueous slurry to electrolytic reduction at the cathode of an electrolytic cell having an insoluble anode,

said precipitate being isolated from said anode during said electrolytic reduction,

and continuing the electrolytic reduction of said precipitate at said cathode until reduction of trivalent metal in said precipitate to the divalent state obtains and hence the dissolution thereof.

4,175,015

PROCESS FOR THE REMOVAL OF LEAD IONS FROM FORMOSE

Edgar Möhring, Bergisch-Gladbach, and Hanns P. Müller, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 17, 1978, Ser. No. 934,579

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738274

Int. Cl.² C25C *1/18*

U.S. Cl. 204—131 **6 Claims**

1. The process comprising removing lead ions from aqueous formose solutions by cathodic electro-chemical deposition.

4,175,016

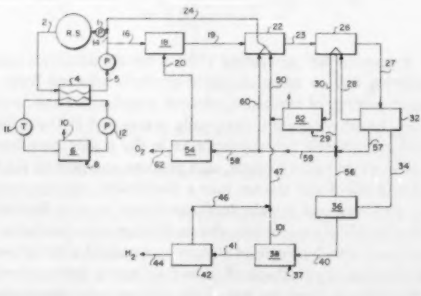
RADIOLYTIC-CHEMICAL METHOD FOR PRODUCTION OF GASES

John G. Lewis; Alfred J. Martin; William W. Meinke, all of Ann Arbor; Charles W. Ricker, Albion, and Robert J. Teitel, Ann Arbor, all of Mich., assignors to Texas Gas Transmission Corporation, Owensboro, Ky.

Continuation-in-part of Ser. No. 609,832, Sep. 2, 1975, abandoned. This application Mar. 30, 1976, Ser. No. 672,016

Int. Cl.² B01J *1/10*

U.S. Cl. 204—157.1 H **1 Claim**



1. A method of separating oxygen from a gaseous mixture

including CO_2, oxygen and CO as a combustible gas reacting therewith, comprising the steps of,

introducing NO into said gaseous mixture to react with oxygen and form NO_2, and

removing the oxygen by separation of NO_2 from the gaseous mixture, converting CO_2 to CO and O_2 in said mixture before introduction of the NO by introducing radiation derived from a thermonuclear fusion reaction in the presence of the CO_2,

and confining the CO_2 to be irradiated in a separate container to receive neutron radiation from the reaction by penetration into the separate container.

4,175,017

SULFUR VULCANIZABLE INTERPOLYMERS

Irving Kuntz, Linden, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 727,802, Sep. 29, 1976, abandoned, which is a division of Ser. No. 629,567, Nov. 6, 1975, Pat. No. 4,051,312, which is a continuation-in-part of Ser. No. 452,969, Mar. 20, 1974, abandoned. This application Feb. 15, 1978, Ser. No. 878,014

Int. Cl.[2] C08F *4/68*

U.S. Cl. 204—159.24 **4 Claims**

1. Process for the production of an alternating elastomeric sulfur vulcanizable interpolymer of:

(A) one or more C_2–C_{20} acyclic or alicyclic olefins having the general formula

$$R-C(R')=CH_2$$

wherein R and R′ are independently selected from the group consisting of halogen, hydrogen, straight and branched chain alkyl radicals, aryl, alkylaryl, arylalkyl and cycloalkyl radicals, plus:

(B) about 50 mole percent of one or more C_1–C_{20} acyclic or alicyclic esters of acrylic acid wherein said acyclic or alicyclic ester radical moiety is free of olefinic unsaturation; and

(C) a minor molar proportion, about 0.10 to 10 mole percent of the total monomers present in said interpolymers, of one or more C_4–C_{10} acyclic conjugated diolefins; said (A) and (B) components forming polymer segments interconnected by said (C) components and said (A) and (C) components comprising a total of about 50 mole percent which comprises:

reacting said olefins, acrylic acid esters and conjugated diolefin monomers in a solvent with a catalyst system comprised of an organoaluminum Lewis acid, a vanadium compound and a free-radical generator at a temperature in the range of −100° C. to 100° C. for a period of time in the range of 2 minutes to 200 hours, and recovering the interpolymer, wherein the molar ratio of organoaluminum compound to vanadium compound is 3 to 30 mols of organoaluminum compound per mol of vanadium compound.

4,175,018

METHOD OF ELECTROCOATING

Gerald R. Gacesa, Baden, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 760,781, Jan. 19, 1977, abandoned. This application May 9, 1977, Ser. No. 795,452

Int. Cl.[2] C25D *13/16*

U.S. Cl. 204—181 T **9 Claims**

1. A method for electrocoating a continuous length of flat metal sheet comprising:

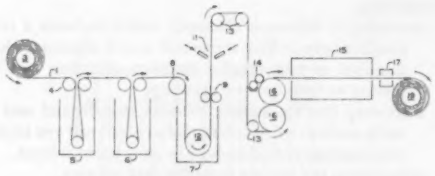
(A) withdrawing the flat metal sheet from a source of supply and continuously

(B) passing said sheet into an aqueous electrodeposition bath which contains as an electrocoating vehicle

(1) a water-soluble resinous coating material,

(2) a water-insoluble emulsified resinous material having a molecular weight of at least 250,000,

(C) electrodepositing said vehicle on said sheet to form a primer coating as the sheet passes through the bath,



(D) continuously removing the primer coated sheet from the bath and passing it to a coating station,

(E) applying a top coat to the primer coated sheet at the coating station without having previously cured said primer,

(F) curing the top and primer coatings simultaneously, and

(G) leading the coated metal sheet to a point of accumulation.

4,175,019

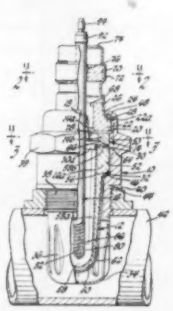
HEATED SOLID ELECTROLYTE OXYGEN SENSOR

Michael P. Murphy, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,644

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 S **6 Claims**



1. In a galvanic exhaust gas sensor having a solid electrolyte member, an outwardly flanged concentric tubular terminal for a reference electrode on one face of said electrolyte member, an inwardly flanged tubular metal shell surrounding said electrolyte member and said terminal, and means coacting with said terminal and shell flanges for biasing said member, terminal and shell together in a fixed predetermined relationship, the improvement wherein said tubular electrode terminal supports an electrical resistance element for heating said electrolyte member and at least one discrete resistance element terminal in a subassembly unitly assemblable with said electrolyte member and metal shell, said resistance element having a fixed predetermined axial alignment and displacement with respect to said electrode terminal, whereby said means for biasing the electrolyte member, electrode terminal and shell also aligns said resistance element with said electrolyte member and spaces said element and said electrolyte member a predetermined distance apart.

4,175,020

METHOD OF STERILIZING REFERENCE ELECTRODES AND THE LIKE

Jiri Janata, and Paul T. McBride, both of Salt Lake City, Utah, assignors to University of Utah, Utah

Filed Oct. 10, 1978, Ser. No. 949,573
Int. Cl.[2] A61L *1/00;* G01N *27/30*
U.S. Cl. 204—195 B **7 Claims**

1. A method of sterilizing and charging a reference electrode comprising

providing a reference electrode which includes a tubular member open at least at one end, and an electrode element disposed in said tubular member, said one end being formed to function as a capillary,

delivering into the tubular member to surround said electrode element a first solution of a certain salt and hydroxyethylmethacrylate dissolved in an organic solvent,

evaporating the solvent from the first solution,

exposing the surfaces of the reference electrode to a sterilizing gas,

aerating the reference electrode, and

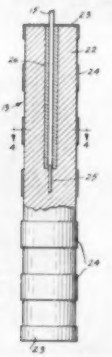
applying a sterile second solution of said certain salt to the reference electrode until the osmolality of the solution within the tubular member and the second solution is substantially the same.

4,175,021

APPARATUS FOR PREVENTING END EFFECT IN ANODES

Joe F. Tatum, and Thomas H. Lewis, both of Hattiesburg, Miss., assignors to C. E. Equipment Co., Inc., Hattiesburg, Miss.

Filed Mar. 6, 1978, Ser. No. 884,057
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—196 **4 Claims**



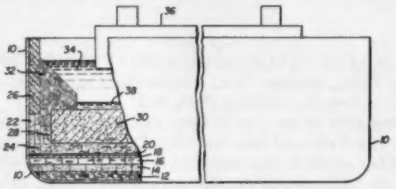
1. Apparatus for preventing end effect in anodes used in an impressed current deep well cathodic protection system for metallic structure in which the apparatus intimately engages a carbonaceous backfill, comprising an anode having an elongated body of current conducting material located along a longitudinal axis, a plurality of current conducting and non-conducting segment alternately disposed along the length of the surface of said body and generally normal to the longitudinal axis thereof, each end of said body terminating in a non-conducting segment, said conducting segments being equally spaced along said body and being separated by said non-conducting segments, said conducting segments being substantially the same length as said non-conducting segments other than the non-conducting segments at the ends of said body, the length of each conducting segment being no more than three times the diameter thereof, means for connecting said body to a source of impressed electrical current so that a uniform electronic current is discharged from each of said conducting segments, and said connecting means supporting said anode within the carbonaceous backfill.

4,175,022

ELECTROLYTIC CELL BOTTOM BARRIER FORMED FROM EXPANDED GRAPHITE

Jostein J. Vadla, Lewiston, N.Y., and Harold J. Wilder, Bay Village, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,652
Int. Cl.[2] B32B *9/04, 15/04;* C25C *9/00*
U.S. Cl. 204—243 R **27 Claims**



1. In an electrolytic cell, for the electrolytic reduction of metal ores, said cell having a steel shell and a lining of insulation on the bottom and sides thereof, the improvement consisting of a lining on the bottom of said shell comprising thermal insulation and a protective layer of at least one graphite sheet formed from expanded graphite on top of said insulation.

2. In an electrolytic cell, for the electrolytic reduction of metal ores, said cell having a steel shell and a lining of insulation of the bottom and sides thereof, the improvement consisting of a lining on the bottom of said shell comprising thermal insulation, a steel sheet on top of said insulation and directly resting on top of said steel sheet, a protective layer comprising at least one graphite sheet formed from expanded graphite.

4,175,023

COMBINED CATHODE AND DIAPHRAGM UNIT FOR ELECTROLYTIC CELLS

Shyam D. Argade, Woodhaven, Mich., and Thomas G. Coker, Natick, Mass., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 694,976, Jun. 11, 1976, abandoned, Division of Ser. No. 611,030, Sep. 8, 1975, Pat. No. 4,049,841. This application Jul. 17, 1978, Ser. No. 924,896
Int. Cl.[2] C25B *11/03, 11/04, 13/08*
U.S. Cl. 204—252 **16 Claims**

1. In a method for manufacturing a chlor-alkali electrolytic cell having a cathode and a fibrous diaphragm juxtaposed thereto, the improvement comprising

spray coating by plasma spraying or flame spraying a ferrous metal substrate with a powder metal selected from the group consisting of nickel, cobalt, tungsten carbide and mixtures thereof in a manner that forms the cathode with the cathode surface having a larger true surface area than the geometric surface area of the substrate, and

vacuum depositing fibers onto a spray coated surface of the cathode to form the fibrous diaphragm securely adhered thereto,

said fibrous diaphragm being formed from a fibrous slurry in which a major portion of the fibers are an organic thermoplastic polymer.

4,175,024

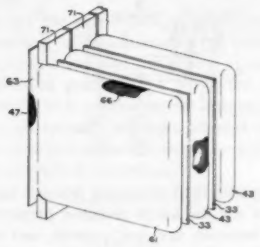
ELECTROLYTIC CELL MEMBRANE SEALING MEANS

William B. Darlington, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 22, 1978, Ser. No. 963,248
Int. Cl.[2] C25B *9/00, 11/03, 13/04*
U.S. Cl. 204—252 **9 Claims**

1. In an electrolytic cell having two electrode units of oppo-

site polarity, each of said electrode units having fingered electrodes extending outwardly toward the electrode unit of opposite polarity whereby the electrodes are interleaved between electrodes of opposite polarity, at least one of said electrode units comprising a base plate, foraminous fingered electrodes mechanically and electrically connected to the base plate, said fingered electrodes bearing an enveloping synthetic separator



and a back screen parallel to and spaced from the base plate, the improvement comprising:

(a) said synthetic separator having a lap bearing upon said back screen; and

(b) the fingered, interleaved electrodes of the electrode unit of opposite polarity compressively bearing upon said lap whereby to provide an electrolyte tight seal.

4,175,025

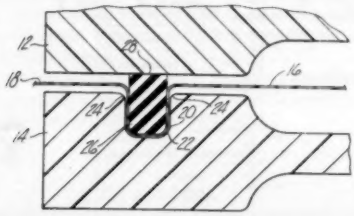
SEALED MEMBRANE FILTER PRESS ELECTROLYTIC CELLS

Edward D. Creamer, Ypsilanti, Mich., and Michael Krumpelt, Naperville, Ill., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jul. 7, 1978, Ser. No. 922,592

Int. Cl.[2] C25B *9/00, 13/00*

U.S. Cl. 204—253 **8 Claims**



1. In an electrolysis cell assembly of the filter-press type having frames, wherein the assembly comprises

a membrane formed to fit between adjacent frames, and having a surface area substantially larger than the frames,

a recess in at least one of said adjacent frames extending around the periphery of the frame, and

a gasket formed to fit into said recess and bear against the other of said adjacent frames,

whereby the gasket holds the membrane in position and provides a complete seal between the frames when they are forced relatively together by clamping forces,

said membrane being sized to extend beyond the periphery of the frames when in assembled position.

4,175,026

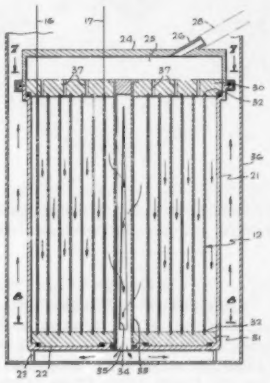
ELECTROLYTIC APPARATUS FOR RECOVERING METAL FROM SOLUTIONS

Kenneth R. Houseman, St. Charles, Ill., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Jul. 16, 1976, Ser. No. 705,770

Int. Cl.[2] C25C *7/02;* **C25B** *11/02, 11/04*

U.S. Cl. 204—272 **31 Claims**



1. An electrolytic apparatus for recovering a metal from a solution containing ions of the metal, said apparatus comprising:

a cell including a sheet of insulating material having a first coating of conductive material located on one side thereof to form a cathodic surface and a second coating on the other side thereof to form an anodic surface;

means for impressing a voltage between said anodic and cathodic surfaces: and

means for passing the metal ion-containing fluid through said cell and across said surfaces.

4,175,027

APPARATUS FOR RECOVERING ZINC FROM RESIDUES

Jean-Claude Catonné, La Celle Saint-Cloud; Jean Royon, La Varenne; Maurice Bonnemay, Boulogne; Marie-Thérèse Descarsin, Paris; Marcel Bernard-Maugiron, Meulan; Henri Fencki, Le Cateau, and Jean-Francois Fayolle, Bertry, all of France, assignors to Societe d'Etudes pour la Recuperation Electrolytique du Zinc, Paris, France

Filed Sep. 9, 1977, Ser. No. 831,918

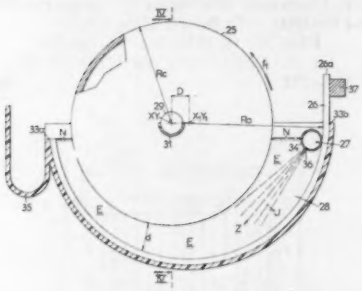
Claims priority, application France, Sep. 10, 1976, 76 27302; Dec. 4, 1977, 77 01942; Aug. 9, 1977, 77 25416

Int. Cl.[2] C25C *7/00*

U.S. Cl. 204—275 **5 Claims**

1. An improved electrolysis installation for the continuous extraction of zinc from electrolyte solution by cathodic deposition comprising, a cathode in the form of a cylinder of revolution capable of being rotated about its horizontal axis and located above a cylindrical anode having its concavity directed towards the cathode and having a generatix parallel to the axis of the cathode which it encloses at least partially and, means for introducing the electrolyte solution to be treated into the interelectrode space between the cathode and the anode, wherein the improvement comprises means for introducing the electrolyte solution, said means located close to the surface of the anode and the surface of the electrolyte, so that the injection of said electrolyte takes place uniformly along the cathode in a direction opposite the rotational direction of the cathode into the interelectrode space which is laterally defined by walls substantially perpendicular to the axis of the cathode, the walls located at a small distance from the ends of the cath-

ode, so that the amount of electrolyte leaving the inter-electrode space is equivalent to the amount entering therein, the



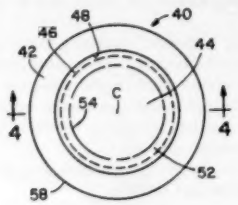
interelectrode distance decreasing with distance from the location of the means for introducing the electrolyte solution.

4,175,028

ELECTRODE MEMBRANE

Alan J. Payton, Harvard, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,413
Int. Cl.[2] G01N *27/46;* C25B *13/02*
U.S. Cl. 204—296 **5 Claims**



1. An electrode membrane structure comprising: an annular membrane support having a central membrane portion integrally molded with said annular support, said membrane structure being formed of a material which is gas diffusible when formed sufficiently thin to provide the central membrane portion, an array of perforations formed about the periphery of said central membrane portion to facilitate removal or separation of the annular support from the membrane portion, and an intermediate annular transition zone between said support and membrane portions wherein the thin membrane portion increases in thickness to that of the support, such that the gas diffusible material may be molded to the sufficient thinness required for diffusibility and yet maintain stability and dimension.

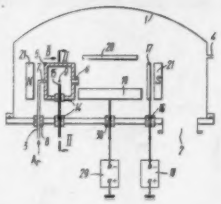
4,175,029

APPARATUS FOR ION PLASMA COATING OF ARTICLES

Georgy A. Kovalsky, ulitsa Stroitelei 4, korpus 7, kv. 6; Jury P. Maishev, Sumskoi proezd 21, korpus 1, kv. 43; Boris A. Egorov, ulitsa Kharkovskaya 3, korpus 1, kv. 38, and Jury A. Dmitriev, ulitsa Kakhovka 21, korpus 1, kv. 10, all of Moscow, U.S.S.R.

Filed Mar. 16, 1978, Ser. No. 887,229
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 **17 Claims**

1. An apparatus for ion plasma coating of articles, wherein a plasma flow is produced by an electric field between an anode and a hot cathode in a vacuum chamber, comprising: a discharge chamber accommodated in said vacuum chamber and having at least a single slit provided in one of the walls of said discharge chamber, said anode and hot cathode being so arranged in said discharge chamber that the hot cathode is opposite said slit; a target to be subjected to sputtering and a holder of said articles to be coated arranged in said vacuum chamber on opposite sides of the plasma flow; a magnetic system to



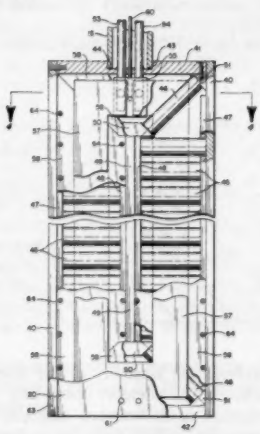
produce a magnetic field extending through said hot cathode and said slit of the discharge chamber perpendicular to said electric field between said hot cathode and anode; and an electron repeller arranged opposite the slit of the discharge chamber, the article holder and target being interposed between the discharge chamber and the electron repeller.

4,175,030

TWO-SIDED PLANAR MAGNETRON SPUTTERING APPARATUS

Robert B. Love, and Alan W. Bowen, both of Franklin, Tenn., assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 858,656, Dec. 8, 1977, Pat. No. 4,116,806. This application Sep. 22, 1978, Ser. No. 944,704
The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 **17 Claims**



1. A two-sided planar magnetron cathode comprising
a substantially planar frame formed about a substantially parallel interior plane,
a plurality of magnets supported within the frame and positioned with a neutral axis of each magnet substantially in the interior plane, and
at least one target plate supported on the frame on opposite sides of the interior plane.

4,175,031

HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application Jun. 30, 1978, Ser. No. 921,160

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—138 21 Claims

1. A process for the conversion of a hydrocarbon which comprises contacting said hydrocarbon at reforming conditions with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier containing a uniform dispersion of a catalytically effective amount of a platinum group component, which is maintained in the elemental metallic state, and of an indium component.

4,175,032

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 786,744, Apr. 11, 1977, Pat. No. 4,110,201, which is a division of Ser. No. 621,718, Oct. 14, 1975, abandoned. This application Aug. 28, 1978, Ser. No. 937,623

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 27 Claims

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % cadmium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and cadmium components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the cadmium component is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon dehydrocyclization conditions or in a mixture of these states.

19. A method as defined in claim 1 wherein the dehydrocyclizable hydrocarbon is contained in a naphtha fraction boiling in the range of about 140° F. to about 400° F.

4,175,033

HYDROPROCESSING OF HYDROCARBONS OVER NICKEL, MOLY, PLATINUM CATALYST

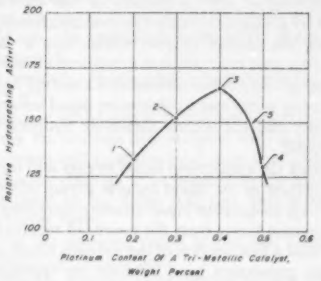
Lee Hilfman, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 810,323, Jun. 27, 1977, Pat. No. 4,148,759, which is a continuation-in-part of Ser. No. 684,055, May 6, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,781

Int. Cl.[2] C10G *23/06;* B01J *23/56, 27/04, 29/12*

U.S. Cl. 208—143 10 Claims

1. A hydrocarbon hydroprocess which comprises reacting a hydrocarbon with hydrogen at conditions selected to effect chemical consumption of hydrogen, and in contact with a catalytic composite comprising a combination of a nickel component, a molybdenum component and a platinum component with a zeolitic carrier material wherein said platinum component is present in an amount sufficient to result in the composite



containing, on an elemental basis, about 0.2 to about 0.5 percent by weight platinum.

4,175,034

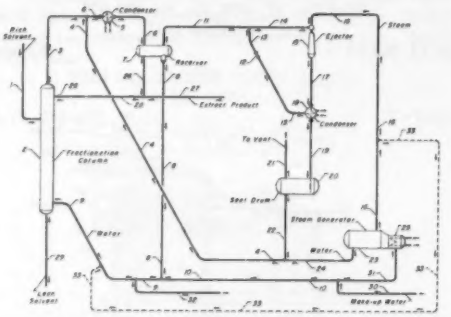
CLOSED-LOOP VACUUM FRACTIONATION PROCESS

H. Lytle Thompson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 10, 1978, Ser. No. 949,606

Int. Cl.[2] B01D *3/10;* C10G *7/00, 21/28*

U.S. Cl. 208—321 7 Claims



1. A method of fractionating distillable mixtures which comprises the steps of:

(a) passing a feed stream comprising water and a mixture of a first and a second distillable hydrocarbonaceous compounds into a fractionation column at a first point, and removing a first product stream comprising the first distillable hydrocarbonaceous compound from the fractionation column at a second lower point;

(b) effecting a partial condensation of an overhead vapor stream comprising water vapor and the second distillable hydrocarbonaceous compound and which is removed from the fractionation column by admixing the overhead vapor stream with a hereinafter specified liquid recycle stream and by passing the overhead vapor stream through a first condensing zone, and passing the resultant mixed-phase stream into an overhead receiver maintained at a subatmospheric pressure;

(c) withdrawing an overhead liquid comprising the second distillable hydrocarbonaceous compound and containing less than 10 mole percent water from the overhead receiver, passing a first portion of the overhead liquid into the fractionation column as reflux and removing a second portion of the overhead liquid as a second product stream;

(d) passing a first vapor stream comprising water and the second distillable hydrocarbonaceous compound from the overhead receiver to the suction inlet of a steam-jet ejector operated at conditions effective to maintain the subat-

mospheric pressure in the overhead receiver and thereby forming an ejector effluent stream comprising the second distillable hydrocarbonaceous compound and steam;

(e) condensing at least a portion of the ejector effluent stream by passage through a second condensing zone;

(f) passing the ejector effluent stream into a vapor-liquid separation zone maintained at conditions effective to separate the ejector effluent stream into a second vapor stream comprising water and a condensate liquid stream comprising water and the second distillable hydrocarbonaceous compound;

(g) admixing the condensate liquid stream into the overhead vapor stream as the liquid recycle stream of step (b);

(h) removing an aqueous liquid stream comprising at least 60 mole percent water from the overhead receiver and passing at least a first portion of the aqueous liquid stream into a steam generation zone wherein by indirect heat exchange against a high temperature fluid the first portion of the aqueous liquid stream is at least partially vaporized to form moderate pressure steam; and,

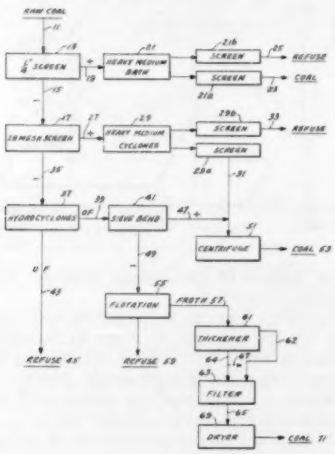
(i) passing at least a portion of the moderate pressure steam into the steam-jet ejector of step (d) as the motive stream utilized in the ejector.

4,175,035

METHOD FOR INCREASING FINE COAL FILTRATION EFFICIENCY

William H. Moyer, Jr., Coopersburg, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 27, 1978, Ser. No. 881,977
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—5 **4 Claims**



1. In a coal treatment process wherein coal fines are treated in a flotation process followed by filtration of the resultant flotation froth product containing water, coal particles and froth bubbles to isolate coal fines, the improvement comprising:

(a) collecting the flotation froth product prior to filtration,

(b) treating the collected flotation froth product in a thickening apparatus containing a sufficient body of aqueous liquid to physically decompose a portion of the froth and yield (1) a thickened froth which floats upon the surface of the body of aqueous liquid, (2) a coal containing aqueous liquid stream removed from a point between the surface of the aqueous liquid and the bottom of the thickening apparatus and (3) an underflow of a slurry of coal particles which sink to and are removed from the bottom of the thickening apparatus,

(c) removing the thickened flotation froth from the thickening apparatus, and

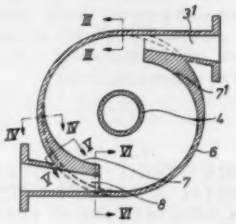
(d) filtering the thickened flotation froth to yield said coal fines.

4,175,036

HYDROCYCLONE SEPARATOR

Rune H. Frykhult, Huddinge, Sweden, assignor to AB Celleco, Stockholm, Sweden

Filed Jul. 10, 1978, Ser. No. 923,207
Claims priority, application Sweden, Jul. 18, 1977, 7708270
Int. Cl.[2] B04C *5/04*
U.S. Cl. 209—211 **4 Claims**



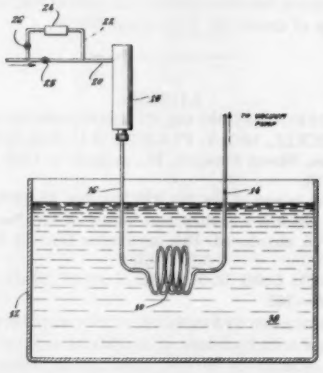
1. In a hydrocyclone separator for separating a mixture into two fractions, the combination of means forming a separation chamber having an axis and a surrounding wall, said chamber including a circular cylindrical part provided with at least one tangential inlet for the incoming mixture and with a central first outlet for one of the fractions, said inlet having an orifice in the chamber, said chamber also including a conical part and a second outlet for the other fraction and to which said conical part leads, and a guide bar located in said cylindrical part of the separation chamber, said bar extending from said wall circumferentially along said wall at least to said orifice and being bent and inclined to give the flow of mixture fed through said inlet a component of movement directed radially inward and a component of movement directed axially toward said conical part of the chamber.

4,175,037

PROCESS FOR PACKING CHROMATOGRAPHIC COLUMNS

Charles H. Benney, Stamford, Conn., and Thomas J. Filipi, Landenberg, Pa., assignors to Whatman Inc., Clifton, N.J.

Filed Apr. 10, 1978, Ser. No. 894,716
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C **33 Claims**



1. A method of packing a chromatographic column which

comprises introducing a packing material into a chromatographic column in a predetermined direction under the influence of a first pressure differential and in the substantial absence of substantially regular periodic vibration until said chromatographic column is filled to a desired extent with said packing material, and subsequently establishing a substantially regular periodic vibration along the length of said column and subjecting said packing material to a second pressure differential therein, said first and second pressure differentials being applied in said predetermined direction so as to aid in filling and packing said column with said packing material.

4,175,038

PURIFICATION OF WASTE STREAMS CONTAINING AVAILABLE CHLORINE

Walter J. Sakowski, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Jul. 21, 1978, Ser. No. 926,771
Int. Cl.[2] C02B *1/36*
U.S. Cl. 210—62 **8 Claims**

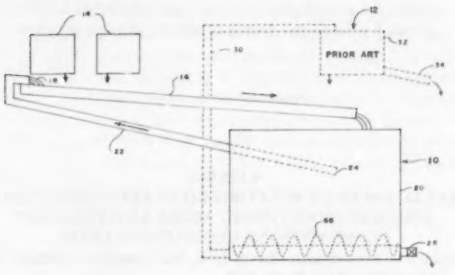
1. A process for reducing the available chlorine content of an impure aqueous solution of the type produced in a plant selected from the group consisting of an alkali metal hypochlorite plant and an alkaline earth metal hypochlorite plant which comprises chlorinating said impure aqueous solution at a temperature in the range between about 80° to about 100° C. and at a pH in the range from about 5.5 to about 8.5, whereby a major portion of said available chlorine is formed into the corresponding chlorate.

4,175,039

WASHER/SEPARATOR SYSTEM FOR DRILLING CUTTINGS IN WATER ENVIRONMENT OIL WELLS

Johnny D. Fisher, 118 Clause La., Lafayette, La. 70507

Filed Jan. 30, 1978, Ser. No. 873,377
Int. Cl.[2] B01D *21/02*
U.S. Cl. 210—74 **4 Claims**



1. The method of disposing of cuttings intermingled with fluids, such as oil, which are considered pollutants in water, from a well being drilled in a water environment comprising the following steps:

(a) providing a washer/separator system at the drilling site which includes

a washer/separator receiving tank having an initial portion into which the cuttings with mud and/or other fluid coatings thereon and water are dumped;

a cuttings outlet feed secion located at the bottom of said tank;

guiding means for directing and guiding the cuttings into said outlet feed section;

a cutting outlet opening in said tank adjacent said outlet feed section;

extended mechanical screw driving means for moving the cuttings from said feed section to and through said outlet openings for dumping out the cuttings;

fluid outlet means located substantially above said cuttings outlet feed section and away from said initial portion of said tank for removing the fluids from said tank;

agitation means located in said initial portion of said tank where the coated cuttings and fluids are initially introduced into the tank for enhancing the washing of the cuttings; and

control means for turning said screw driving means "on" and "off";

(b) providing an initial supply of treating fluid into said tank;

(c) dumping the cuttings intermingled with fluids into said initial portion and agitating them with the treating fluids;

(d) allowing the cuttings to be washed by the agitation and treating fluids to fall down into said feed section at the bottom of the tank;

(e) allowing the polluting fluids to rise and collect in the fluid containing interior area;

(f) intermittently and cyclically turning on said screw driving means when said feed section is filled with washed cuttings to drive the washed cuttings out of the tank;

(g) disposing of the washed cutting by dumping the washed cuttings into the water environment; and

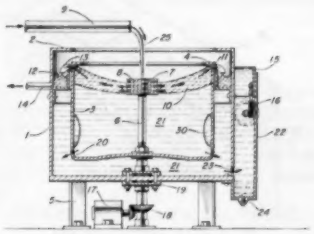
(h) intermittently and cyclically turning off said screw driving means upon the fluid level in said tank reaching a pre-selected minimum level; whereby the cuttings are regularly disposed of into the water environment without pollution problems.

4,175,040

CENTRIFUGAL WATER OIL SEPARATOR

John K. Sammons, Marrero, and Charles H. Fox, Jr., Slidell, both of La., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 28, 1978, Ser. No. 937,391
Int. Cl.[2] B04B *1/12*
U.S. Cl. 210—78 **9 Claims**



1. An apparatus for recovering oil from oil water mixtures comprising two nested bowls; an outer stationary and an inner rotating bowl having an annulus therebetween, the inner bowl having a flange affixed to the upper periphery thereof and covering a portion of the bowl interior, each bowl being penetrated by a shaft, said shaft being rigidly affixed to the inner bowl and rotatably attached to the outer bowl by means sealing the shaft aperature from liquid passage, said shaft connected at the lower end to motive means capable of rapidly rotating said shaft and at the upper end to a perforated basket rigidly fixed to said shaft, said inner bowl having multiple aperatures in the lower portion thereof and multiple aperatures at the upper periphery thereof substantially adjacent said flange and a groove or channel in the annulus rigidly affixed to said stationary outer bowl at a level below the level of the upper aperatures in the rotatable inner bowl, the lower portion of said channel in fluid communication with the exterior of the stationary outer bowl and at least one aperature in the lower portion of the outer bowl in fluid communication with a fluid leveling means capable of balancing inflow and outflow.

7. A method for continuously recovering oil from oil-water mixtures comprising placing a stream of oil-water mixture into an oil-water separator having an outer stationary bowl and an inner rotatable bowl having an annulus therebetween, the inner

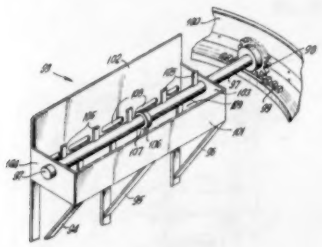
bowl having a flange affixed to the upper periphery thereof and covering a portion of the bowl interior, each bowl penetrated by a shaft said shaft being rigidly fixed to the inner bowl and rotatably attached to the outer bowl by means sealing the shaft aperature from liquid passage, said shaft having at the upper end a dispersant means rigidly affixed to said shaft, said inner bowl having multiple aperatures in the lower portion thereof and multiple aperatures at the upper periphery thereof substantially adjacent said flange, and a groove or channel in the annulus between the bowls, rigidly fixed to said stationary outer bowl at a level below the level of the upper aperatures in the periphery of the rotatable inner bowl, said channel being in fluid communication with the exterior of the outer bowl; at least one aperature in the lower portion of the outer bowl in fluid communication with a fluid leveling means capable of balancing inflow and outflow, wherein oil-water mixture entering the rapidly rotating dispersing means passes into the rapidly rotating inner bowl, separates into heavier water in the lower portion thereof and lighter oil at the upper portion thereof, the centrifugal force passing the oil to the upper portion thereof and through said aperatures into a channel from which oil is recovered, and water is passed through the lower aperatures thereof into the annulus from whence said water flows to a fluid leveling means whereby the inflow and outflow are balanced.

4,175,041

APPARATUS FOR DEGASSING FLOATING SLUDGE

Raymond F. Drnevich, Clarence; Kallidaikurichi N. Venkataraman, Tonawanda, and Thomas E. Walder, Newfane, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,559
Int. Cl.[2] B01D *19/02*
U.S. Cl. 210—188 **11 Claims**



1. Apparatus for degassing floating solids containing entrapped gas in an open-topped liquid-solid settling chamber wherein said floating solids tend to accumulate at the surface of liquid being separated from solids, said solid-liquid settling chamber including means for introducing liquid-solid to be separated to said chamber, means for withdrawing solids-depleted liquid from an upper section of said chamber and means for withdrawing settled solids from a lower section of said chamber, said apparatus comprising: an open-topped trough enclosure positioned such that said trough enclosure is partially submerged in the liquid in said liquid-solid settling chamber, having a first wall member terminating at an upper end below the surface of liquid in said liquid-solid settling chamber and a second wall member substantially parallelly aligned with respect to the first wall member and spaced therefrom, terminating at an upper end above the surface of liquid in said liquid-solid settling chamber, whereby liquid containing floating solids is flowed into said trough enclosure over said first wall member thereof; a rotatable shaft mounted in said trough enclosure with its longitudinal axis generally horizontally oriented and parallel to said first and second wall members of said trough enclosure; a plurality of radially extending, non-helical blades joined to said shaft along the length thereof; means for rotating said shaft whereby said blades gently agitate said liquid containing floating solids in said trough enclosure for degassing of same, to form liquid containing degassed solids; and means for discharging said liquid containing degassed solids from said trough enclosure into said liquid-solid settling chamber.

4,175,042

WELL COMPLETION AND WORK OVER FLUID AND METHOD OF USE

Thomas C. Mondshine, Houston, Tex., assignor to Texas Brine Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 735,169, Oct. 26, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,639
Int. Cl.[2] E21B *43/00*
U.S. Cl. 252—8.55 R **16 Claims**

1. A well completion and work over fluid consisting essentially of:

a. a saturated brine solution consisting of any of the group of potassium chloride, sodium chloride, calcium chloride, sodium sulfate, sodium carbonate, sodium bicarbonate, calcium bromide and potassium carbonate;

b. a bridging agent consisting of at least one water soluble sized salt which is insoluble in the saturated brine solution, said sized water soluble salt having a particle size in the range of approximately 5 microns to approximately 800 microns and wherein greater than about 5% of the particles are coarser than 44 microns;

c. the sized soluble salt that is insoluble in the saturated brine solution consisting of any of the group of potassium chloride, sodium chloride, calicum chloride, sodium sulfate, sodium carbonate, sodium bicarbonate, calcium bromide and potassium carbonate in the amount of approximately 4 pounds per barrel to about 50 pounds per barrel of saturated brine solution; and

d. a viscosifier and suspension additive in the amount of about 0.2 pound per barrel of saturated brine solution to about 5 pounds per barrel of saturated brine solution.

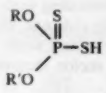
4,175,043

METAL SALTS OF SULFURIZED OLEFIN ADDUCTS OF PHOSPHORODITHIOIC ACIDS AND ORGANIC COMPOSITIONS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,448
Int. Cl.[2] C10M *1/48, 3/42;* **C07G** *17/00*
U.S. Cl. 252—32.7 E **24 Claims**

1. An organothiophosphorus compound comprising a metal salt of the reaction product of (1) a phosphorodithioic acid having the general formula:



wherein R and R′ are hydrocarbyl and are the same or different with each having up to about 30 carbon atoms and (2) a sulfurized olefin having from about 2 to about 8 carbon atoms and sufficient reactive olefinic sites to react with said acid, thereby incorporating into the resultant organothiophosphorus compound from about 0.1 to about 10 wt. % of phosphorus.

4,175,044

MANNICH BASE COMPOSITION AND LUBRICATING OIL COMPOSITIONS CONTAINING SAME

Donovan R. Wilgus, Richmond, and John M. King, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

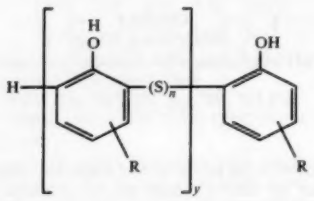
Continuation-in-part of Ser. No. 756,568, Jan. 3, 1977, abandoned. This application Sep. 30, 1977, Ser. No. 838,196

Int. Cl.[2] C10M *1/54*

U.S. Cl. 252—42.7 **10 Claims**

1. A Mannich base condensation product selected from the group consisting of

(A) The Mannich base p epared by condensing formaldehyde and a polyamine with a sulfur-containing phenolic mixture consisting of (1) from 5 to 40% of a sulfurized alkylphenol of the formula

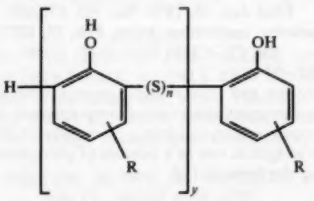


wherein R is C_8–C_{36} alkyl, n is an integer from 1 to 8, and y is an integer from 1 to 9, and (2) from 95 to 60% of a phenolic mixture consisting of (a) from 95 to 30% phenol alkylated with a propylene tetramer, and (b) from 5 to 70% phenol alkylated with a straight-chain alpha-olefin of from 16 to about 28 carbon atoms or alpha-olefin mixtures wherein the olefins are of from 16 to about 28 carbon atoms and

(B) the alkaline earth metal salts thereof.

4. A lubricating oil composition comprising an oil of lubricating viscosity and from 0.1 to 40% by weight of the condensation product or an alkaline earth metal salt thereof of claim **1**.

8. A process for preparing a Mannich base condensation product or an alkaline earth metal salt thereof which comprises condensing 0.5 to 0.85 mol of formaldehyde, at least 0.3 mol of a polyamine, and 1.0 mol of a sulfur-containing phenolic mixture consisting of (1) from 5 to 40% of a sulfurized alkylphenol of the formula



wherein R is C_8–C_{36} alkyl, n is an integer from 1 to 8, y is an integer from 1 to 9, and (2) from 95 to 30% phenol alkylated with propylene tetramer, and (b) from 5 to 70% phenol alkylated with a straight-chain alpha-olefin of from 16 to about 28 carbon atoms or alpha-olefin mixtures wherein the olefins are of from 16 to 28 carbon atoms, and, optionally, forming the alkaline earth metal salt thereof by treating the Mannich base with an alkaline earth metal hydroxide in the presence of a promoter.

4,175,045

COMPRESSOR LUBRICATION

Peter E. Timony, Valley Cottage, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 27, 1978, Ser. No. 881,483

Int. Cl.[2] C10M *3/20*

U.S. Cl. 252—56 S **9 Claims**

1. A method of lubricating a compressor which comprises bringing the components of said compressor which are to be lubricated into contact with an effective amount of a synthetic lubricant composition comprising a polyol ester of a carboxylic acid having from about 4 to about 13 carbon atoms in its structure.

4,175,046

SYNTHETIC LUBRICANT

Pierre M. Coant, Woodbury, and George W. Munns, Jr., West Deptford, Township, County of Gloucester, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 20, 1978, Ser. No. 944,519

Int. Cl.[2] C10M *1/26, 3/20*

U.S. Cl. 252—56 S **11 Claims**

1. In an improved lubricating oil composition comprising a major proportion of a lubricating oil and a combination of additives in an amount sufficient to achieve each additives function, the improvement whereby the lubricating oil composition comprises (1) a blend of oils comprising (a) from about 40 to about 60% by weight of said blend of a hydrogenated oligomer of an alpha olefin having from 6 to 12 carbon atoms and (b) from about 60 to about 40% by weight of said blend of a mixture of at least two synthetic ester oils in the proportion of 20 to 30% by weight of either, said ester oils being prepared by reacting a monocarboxylic acid having from 6 to 18 carbon atoms with a polyhydroxy aliphatic hydrocarbon containing 4 to 8 carbon atoms and from 2 to 4 hydroxyls and (2) said combination of additives, which combination does not contain a viscosity index improver.

4,175,047

SYNTHETIC ESTER AND HYDROGENATED OLEFIN OLIGOMER LUBRICANT AND METHOD OF REDUCING FUEL CONSUMPTION THEREWITH

John W. Schick, Cherry Hill, and Joan M. Kaminski, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,282

Int. Cl.[2] C10M *1/26, 3/20*

U.S. Cl. 252—56 S **24 Claims**

1. An organic fluid composition comprising a lubricating oil having from about 20% by weight to about 40% by weight of a hydroxyl-containing synthetic ester oil, or mixtures thereof, and from about 60% by weight to about 80% by weight of a synthetic hydrocarbon lubricating oil consisting essentially of a hydrogenated oligomer of an alpha olefin having from 6 to 12 carbon atoms.

4,175,048

GASEOUS INSULATORS FOR HIGH VOLTAGE ELECTRICAL EQUIPMENT

Loucas G. Christophorou, Oak Ridge; David R. James; Marshall O. Pace, both of Knoxville, and Robert Y. Pai, Concord, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 6, 1977, Ser. No. 830,973

Int. Cl.[2] H01B *3/56*

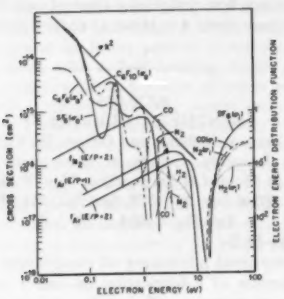
U.S. Cl. 252—63.5 **11 Claims**

1. Apparatus comprising a gas-tight casing, spaced electrical elements therein adapted to be subjected to differences of electrical potential, and a gaseous insulator between said elements, said gaseous insulator comprising a compound selected

from the group of perfluorocyclohexene and hexafluoroazomethane.

7. Apparatus comprising a gas-tight casing, spaced electrical elements therein adapted to be subjected to differences of electrical potential and a gaseous insulator between said elements, said gaseous insulator comprising a synergistic mixture comprising by volume at least 50% N_2, 10–30% hexafluoro-2-butyne, and 10–20% SF_6.

11. An apparatus comprising a gas-tight casing, spaced electrical elements therein adapted to be subjected to differences of electrical potential, and a gaseous insulator between said elements, said gaseous insulator comprising a synergistic mixture comprising a first component selected from the group of perfluorodimethylcyclobutane, perfluorocyclohexene, hexafluoroazomethane, perfluoromethylcyclohexane, hexafluorobutadiene, perfluoroheptene-1, perfluorobutene-2 and mixtures thereof and a second component selected from the group of SF_6, N_2, CO, CO_2, H_2, C_3F_8, C_6F_6 and mixtures thereof.



4,175,049

FUNCTIONAL FLUID METHODS USING ALKOXYSILANE ESTER CLUSTER COMPOUNDS

Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 791,359, Apr. 27, 1977, Pat. No. 4,086,260. This application Jan. 12, 1978, Ser. No. 868,963

Int. Cl.[2] **C10M** *3/46*

U.S. Cl. 252—78.3 **12 Claims**

1. In a method wherein a fluid is used as a medium for the transmission of a functional impulse selected from pressure or heat from a first location to a second location, the improvement characterized by using as the functional fluid a composition containing an effective amount of a compound having the formula:

wherein R is hydrogen, an alkyl, alkenyl, aryl or aralkyl group, and R″ and the R′ groups are independently selected from alkyl, alkenyl, aryl and aralkyl with the proviso that at least a majority of the R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

4,175,050

SHAPED WASHING AGENTS HAVING A MOSAIC-LIKE STRUCTURE AND PROCESS

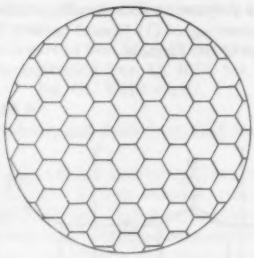
Franz-Josef Carduck, Haan am Rhld; Dietrich Klötzer, Düsseldorf; Werner Schneider, Krefeld, and Willi Wust, Ratingen-Hosel, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,802

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647447

Int. Cl.[2] **C11D** *13/18, 13/14*

U.S. Cl. 252—91 **14 Claims**



1. A process for the production of a soap bar shaped washing agent based on colored soaps and/or synthetic detergents comprising a plurality of individual colored particles of wash active substances selected from the group consisting of soap and synthetic detergent having a size range of 1 to 20 millimeters, so distributed that they adjoin one another with sharply defined boundaries, said boundaries being substantially free of occluded gas, to give a mosaic-like appearance to at least part of the surface of said shaped washing agent which comprises the steps of compressing a plurality of individual colored particles of wash active substances selected from the group consisting of soap and synthetic detergent having a size range of 1 to 20 millimeters at a temperature of from 15° C. to 45° C., at a press rate of from 0.1 to 5 meters per minute under a pressure of from 60 to 450 bar in the substantial absence of gas between said particles at a vacuum of less than 100 torr, to form a soap bar shaped article and recovering said soap bar shaped washing agent.

4,175,051

SCOURING PAD CONTAINING PHOSPHORIC ACID ESTER-FATTY ACID SOAP MIXTURES

Tetsuya Imamura; Takashi Hiraide, both of Tokyo; Haruhiko Arai, Narashino, and Megumu Hirakura, Matsudo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1978, Ser. No. 872,659

Claims priority, application Japan, Feb. 25, 1977, 52-20112

Int. Cl.[2] **C11D** *9/34, 9/46, 17/00*

U.S. Cl. 252—91 **10 Claims**

1. A scouring pad comprising a spongy, fine metal thread pad and a detergent composition impregnated therein, said detergent composition consisting essentially of from 5 to 40 percent by weight of one or a mixture of phosphoric acid ester salts having the formula (I):

$$[R(OCH_2CH_2)_m]_xPO_4H_{3-x-y}M_y \quad (I)$$

wherein R is alkyl or alkenyl having 10 to 22 carbon atoms or alkylphenyl having 6 to 18 carbon atoms in the alkyl group, wherein said alkyls or alkenyl can be linear or branched, m is from 0 to 10, x is from 1.0 to 2.0, y is from 0.5 to 2.0 with the proviso that the sum of x and y does not exceed 3, and M is an alkali metal, ammonium, alkanolamine, alkaline earth metal, zinc or aluminum cation,

and from 50 to 95 percent by weight of fatty acid soap having

10 to 22 carbon atoms, the weight ratio of said detergent composition to said fine metal thread pad being from 0.2/1 to 2.0/1.

4,175,052

ALKALINE-MNO_2 CELL HAVING A ZINC POWDER-GEL ANODE CONTAINING P-N-V-P OR PMA

William E. Norteman, Jr., Elyria, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,311

Int. Cl.[2] H01M *4/62, 4/24, 4/38*

U.S. Cl. 252—182.1 **21 Claims**

1. A powder-gel anode comprising a major portion of a consumable anodic material, a minor amount of poly-N-vinyl pyrrolidone and an aqueous alkaline electrolyte solution.

10. A powder-gel anode comprising a major portion of a consumable anodic material, a minor amount of polymethacrylic acid and an aqueous alkaline electrolyte solution.

4,175,053

BASE REACTANT

Donald J. Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 12, 1976, Ser. No. 731,176

Int. Cl.[2] C09K *3/00;* **C11D** *13/00;* **C07C** *29/14, 17/26*

U.S. Cl. 252—192 **5 Claims**

1. A substantially water free-super base reaction medium consisting essentially of a mixture of an alkali metal hydroxide and an alkyl nitrile selected from the group consisting of acetonitrile and propionitrile wherein the ratio of alkyl nitrile to alkali metal hydroxide is from about 1:1 to about 1000:1.

4,175,054

USE OF HYDROCARBON POLYMERS IN DEMULSIFICATION

William S. Tait, Saint Louis, and Roy W. Greenlee, Ballwin, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 11, 1976, Ser. No. 741,150

Int. Cl.[2] B01D *17/04*

U.S. Cl. 252—331 **11 Claims**

1. A demulsifier composition comprising 1 to 20,000 parts of an oxyalkylated alkyl phenol-aldehyde resin and 5 to 100,000 parts of a hydrocarbon polymer or copolymer having a molecular weight of from 10,000 to 50,000.

5. A process of demulsification which comprises treating an emulsion with a demulsification composition comprising 1 to 20,000 parts of an oxyalkylated alkyl phenol-aldehyde resin and 5 to 100,000 parts of a hydrocarbon polymer or copolymer having a molecular weight of from 10,000 to 50,000.

4,175,055

DRY MIX METHOD FOR MAKING AN ELECTROCHEMICAL CELL ELECTRODE

Glen J. Goller, West Springfield, Mass.; Vincent J. Petraglia, Vernon, and Joseph R. Salonia, Middletown, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 28, 1978, Ser. No. 920,037

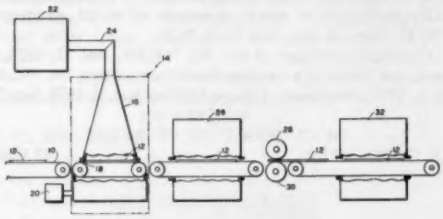
Int. Cl.[2] H01M *4/04, 4/96*

U.S. Cl. 252—425.3 **9 Claims**

1. A method for making an electrochemical cell electrode comprising the steps of:

blending together, in dry form, dry carbon particles and dry hydrophobic polymer particles to form a dry mixture;

applying a uniform layer of the dry mixture on the surface of a porous electrode substrate with virtually none of the mixture within the pores of the substrate by dispersing the mixture as a cloud of particles in a chamber over said surface of the substrate and pulling the carbon and polymer particles onto said surface by drawing a vacuum under the substrate;



compacting the applied layer; and

sintering the compacted layer.

4,175,056

ACTIVATED MULTIMETALLIC CATALYTIC COMPOSITE COMPRISING PYROLIZED RUTHENIUM CARBONYL

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 848,699, Nov. 4, 1977. This application Oct. 27, 1978, Ser. No. 955,555

Int. Cl.[2] B01J *27/10, 27/08, 23/46, 23/42*

U.S. Cl. 252—441 **12 Claims**

1. A catalytic composite comprising the pyrolyzed reaction product of a ruthenium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group element other than ruthenium maintained in the elemental metallic state, wherein said carbonyl component is pyrolyzed under anhydrous conditions in the substantial absence of free oxygen selected to decompose said carbonyl component until the evolution of carbon monoxide is halted.

4,175,057

ZEOLITE COMPOSITION

Evan E. Davies, Woking, and Alexander J. Kolombos, Thames Ditton, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 2, 1977, Ser. No. 856,668

Claims priority, application United Kingdom, Dec. 20, 1976, 53012/76

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z **5 Claims**

1. A zeolite composition comprising an aluminosilicate having a molar ratio of silica to alumina between about 20:1 and 70:1 in which cations have been exchanged with gallium ions or on which a gallium compound has been deposited.

4,175,058

CATALYTIC COMPOSITE FOR OXYDEHYDROGENATION OF ALKYLAROMATIC HYDROCARBONS

Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 862,071, Dec. 19, 1977. This application Aug. 4, 1978, Ser. No. 930,941

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 R **4 Claims**

1. A catalytic composite comprising a combination of cobalt oxide, chromium oxide, alumina and magnesium oxide with a silica carrier material in amounts sufficient to result in a mole ratio of chromium oxide to cobalt oxide of about 0.2:1 to about 2:1, of alumina to cobalt oxide of about 0.05:1 to about 0.5:1 and of magnesium oxide to cobalt oxide of about 0.05:1 to about 0.5:1.

4,175,059

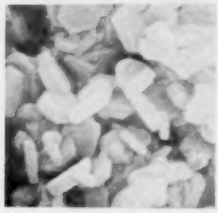
METHOD OF PREPARING A NOVEL PLATELET-TYPE CRYSTALLINE FORM OF SYNTHETIC FAUJASITE

Grant C. Edwards, Silver Spring; David E. W. Vaughan, Ellicott City, and Edwin W. Albers, Annapolis, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 764,246, Jan. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 592,439, Jul. 2, 1975, abandoned. This application Aug. 7, 1978, Ser. No. 931,512

Int. Cl.[2] B01J *29/08*; C01B *33/28*

U.S. Cl. 252—455 Z 15 Claims



1. In a process for preparing synthetic faujasite type zeolites wherein amorphous aluminosilicate zeolite nucelation centers having a particle size of below 0.1 microns are combined with a zeolite producing reaction mixture which contains alumina, silica, alkali metal hydroxide and water, and the mixture is heated to obtain faujasite type zeolite crystals, the improvement comprising:

(a) preparing a reaction mixture containing the following mol ratios of ingredients:
Na_2O/SiO_2—0.3 to 9
SiO_2/Al_2O_3—3 to 25
H_2O/Na_2O—12 to 90
K_2O/Al_2O_3—0.05 to 1.2

(b) adding to said mixture amorphous aluminosilicate zeolite nucleation centers having a particle size of below 0.1 microns, consisting essentially of the following range of composition:
Na_2O—12 to 20
SiO_2—14 to 19
Al_2O_3—0.75–5
H_2O—100 to 600

(c) heating the reaction mixture at a temperature of 40° to 150° C. for a period of about 10 minutes to 30 hours to obtain a faujasite type zeolite product wherein greater than about 5 percent by weight of the crystals comprising said product are characterized by a platelet flattened octahedron shape.

4,175,060

COMPOSITION AND PROCESSING PROCEDURE FOR MAKING THERMISTORS

James W. Fleming, Jr., Fanwood; Henry M. O'Bryan, Jr., Plainfield, and John Thomson, Jr., Spring Lake, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 25, 1977, Ser. No. 854,813

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—518 6 Claims

1. A process for making an electrical device comprising ceramic material with a positive temperature coefficient of resistance, said ceramic material comprising a first material and a second material, said first material comprising a substance with nominal formula $Ba_{1-x}M_xTi_yO_3$ with $x=0.004\pm0.0004$, $y=1.0075\pm0.0025$ and M represents lanthanum doping ion which renders barium titanate semiconducting where said first material is made by mixing together barium, titanium and lanthanum compounds which yield semiconducting barium titanate on heating in which the lanthanum compound is added by precipitation from an aqueous solution of a soluble lanthanum salt and heating said mixture to a temperature of 1150 degrees C. ±25 degrees C. for approximately six hours in an air atmosphere and said second material comprising 0.2 ± 0.05 weight percent Al_2O_3 said process comprising heating a mix-

ture of the first material and the second material to a temperature of from 1300 to 1400 degrees C. for a time between one to four hours in air and cooling in air at a rate between 50 and 200 degrees C. per hour.

4,175,061

METHOD OF MANUFACTURING RESISTOR PASTE

Kenji Fujimura, Hachiohji, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 879,251

Claims priority, application Japan, Jul. 9, 1977, 52-82154

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—518 10 Claims

1. A method of manufacturing a resistor paste comprising the steps of

(a) mixing together 1 to 40 weight percent ruthenium dioxide, 40 to 85 weight percent lead oxide, 10 to 30 weight percent silica, and 1 to 15 weight percent alumina to form a mixture,

(b) fusing the mixture of step (a) at 800° to 1200° C.,

(c) cooling and grinding the fused mixture of step (b), and

(d) adding a TCR modifier and an organic vehicle to the cooled and ground mixture of step (c), said TCR modifier being selected from the group consisting of 2 to 10 weight percent of ZrO_2; 0.5 to 20 weight percent of tin oxide; and 0.5 to 20 weight percent of tin oxide and up to 15 weight percent of Al_2O_3, the sum of which does not exceed 25 weight percent with respect to the total weight of the ground material and organic vehicle.

4,175,062

AQUEOUS CLEANSER COMPOSITIONS

Karlheinz Disch, Haan, and Eva Kiewert, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA), Dusseldorf, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,685

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709690

Int. Cl.[2] C11D *3/065*, *1/83*

U.S. Cl. 252—540 11 Claims

1. Liquid cleanser compositions for cleaning hard surfaces consisting essentially of an aqueous solution containing

(1) from 2% to 30% by weight of a tenside mixture consisting of:

(a) adducts of 3 to 30 mols of ethylene oxide onto alcohols selected from the group consisting of aliphatic-vicinal alkanediols having 10 to 20 carbon atoms and monoalkyl ethers of said alkanediols having 1 to 4 carbon atoms in the alkyl, and

(b) anionic sulfonic compounds selected from the group consisting of linear alkylbenzene sulfonic acids having 8 to 20 carbon atoms in the alkyl, linear alkane sulfonic acids having 8 to 20 carbon atoms, mixtures of said

acids, and water-soluble salts of said acids selected from the group consisting of alkali metal salts, alkaline earth metal salts and ammonium salts, where the ratio of a:b is from 1:1 to 1:20,

(2) from 0 to 3% by weight of a water-soluble salt of a fatty acid having from 12 to 18 carbon atoms, and having a pH in the range of 7.0 to 10.5 as a 2% solution.

4,175,063

RESINOUS PRODUCT

Robert R. Harris, Burnham, and Warren J. Pollack, Carpentersville, both of Ill., assignors to International Minerals & Chemical Corporation, Terre Haute, Ind.

Filed Jun. 1, 1978, Ser. No. 911,654
Int. Cl.[2] C09D *3/52, 3/64, 3/66*
U.S. Cl. 260—22 R **2 Claims**

1. A high-solids resinous product obtained by the process comprising reacting an unsaturated aliphatic monocarboxylic acid 32–34%, one or more aromatic dicarboxylic acids or anhydrides thereof 36–38%, a mixture of bis- and tris(hydroxy-)alkanes 28–30% and a monohydric alcohol 1.2–1.4%, in the presence of catalytic amounts of dibutyl tin oxide and a solvent at a temperature of up to 430° F. until the acid value is less than about 3.0, said resinous product having a non-volatile content of about 96%, a Gardner viscosity about Z_1 and a viscosity at 125° C. of about 0.4 poise.

4,175,064

ACCELERATOR SYSTEMS FOR THE PEROXIDE-CATALYZED CURING OF UNSATURATED POLYESTER RESIN COMPOSITIONS

Marvin Landau, North Bergen, N.J.; Samuel J. Bellettiere, New Hope, Pa., and Samuel Hoch, Brooklyn, N.Y., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Sep. 28, 1978, Ser. No. 946,688
Int. Cl.[2] B01J *31/12;* **C09D** *3/68;* **C09F** *9/00*
U.S. Cl. 260—22 CA **26 Claims**

1. In the process for the curing of an unsaturated polyester resin composition that comprises contacting a composition comprising an unsaturated polyester resin and an unsaturated monomer capable of reacting with said unsaturated polyester resin to form cross-linkages with an organic peroxide catalyst and an accelerator system, the improvements wherein the accelerator system comprises at least one cobalt salt and at least one potassium salt of monocarboxylic acids selected from the group consisting of aliphatic, aromatic, and alicyclic monocarboxylic acids having 6 to 24 carbon atoms and the accelerator system is present in an amount that will provide from 0.001% to 0.1% of cobalt (as metal) and 0.001% to 0.1% of potassium (as metal), based on the weight of the unsaturated polyester resin composition.

4,175,065

METHOD FOR GLUEING WITH CURABLE, FORMALDEHYDE-BASED ADHESIVES AND A CURING COMPOSITION FOR USE IN THE METHOD

Sven-Erik Andersson, Nacka, Sweden, assignor to AB Casco, Stockholm, Sweden

Filed May 12, 1978, Ser. No. 905,393
Claims priority, application Sweden, May 13, 1977, 7705636
Int. Cl.[2] C08L *61/10*
U.S. Cl. 260—29.3 **11 Claims**

1. In the known method of glueing with resins formed from resorcinol-formaldehyde or resorcinol-phenol-formaldehyde precondensates and hardener compositions containing paraformaldehyde suspended in a suspending agent, the improvement which comprises using as a suspending agent for the paraformaldehyde a precondensate between a ketone and formaldehyde.

4,175,066

DISPERSANT FOR CALCIUM CARBONATE

Hiroji Shibazaki, Takarazuka; Setsuji Edagawa; Hisashi Hasegawa, both of Nishinomiya; Takashi Takeuchi; Noboru Moriyama, both of Wakayama, and Yukihiro Fukuyama, Naga, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1978, Ser. No. 893,696
Claims priority, application Japan, Apr. 18, 1977, 52/44259
Int. Cl.[2] C08K *3/26*
U.S. Cl. 260—29.6 M **10 Claims**

1. An aqueous dispersion consisting essentially of water, calcium carbonate particles having a particle size of from 0.02 to 10 microns and, as a dispersing agent, from about 1 to about 5 wt. %, based on the weight of said calcium carbonate particles, of a salt of an acrylic acid/maleic acid copolymer or mixture thereof, the molar ratio of acrylic acid/maleic acid monomer units in said copolymer being in the range of from 100/5 to 100/200 and said copolymer having a molecular weight of from 1,000 to 20,000.

4,175,067

CURABLE BINDER FOR LARGE FOUNDRY SAND SHAPES

Roger H. Kottke, Crystal Lake, and Scott S. Menard, Mt. Prospect, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 17, 1977, Ser. No. 825,447
Int. Cl.[2] C08K *5/05, 3/36, 5/10*
U.S. Cl. 260—30.4 R **11 Claims**

1. A foundry binder comprising monomeric furfuryl alcohol in an amount between 45–85 percent, inclusive, an aromatic resin mixture of carbomethoxy polyphenyl and polycarbomethoxy diphenyls, said aromatic mixture being present in an amount between 5–50 percent, inclusive, another alcohol in an amount between 2–15 percent, inclusive, all percentages being percent by weight based on the weight of the binder.

4,175,068

WATER-SOLUBLE COATING COMPOSITION

Atsushi Kaiya, Kawasaki; Yutaka Otsuki, and Hideo Horii, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Division of Ser. No. 518,824, Oct. 29, 1974, abandoned. This application Oct. 25, 1977, Ser. No. 844,546
Claims priority, application Japan, Nov. 1, 1973, 48/123042
Int. Cl.[2] C08K *5/09*
U.S. Cl. 260—31.2 MR **16 Claims**

1. A water-soluble coating composition comprising an adduct (1) of a butadiene lower polymer or lower copolymer (A) which has a number average molecular weight in a range of 200–10,000 and is a liquid or semi-liquid at room temperature and 60 ,β-ethylenically unsaturated dicarboxylic acid compound (B) resulting from the reaction of said (A) and (B) at a temperature in the range of 120° to 250° C. in the presence of one or more of compounds (C) in an amount of 0.005 to 5 percent by weight of said (A), said compound (C) being selected from catechol derivatives, pyrogallol derivatives, and naphthol derivatives; a hydrophilic solvent (2) in an amount of less than 100 parts by weight to 100 parts by weight of said (A); and a neutralizer (3) in a range of 0.2 to 2.0 equivalents to said (A).

4,175,069
PLASTICIZATION OF NEUTRALIZED SULFONATED ELASTOMERIC POLYMER

Douglas Brenner, Livingston, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 855,547, Nov. 29, 1977, Pat. No. 4,131,587. This application Oct. 2, 1978, Ser. No. 947,430

Int. Cl.[2] C08K *5/18*

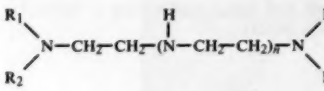
U.S. Cl. 260—32.6 A **12 Claims**

1. An elastomeric composition including:

(a) a neutralized sulfonated elastomeric polymer having about 10 to 80 meq. of neutralized sulfonate groups/100 grams of said neutralized sulfonated polymer, and

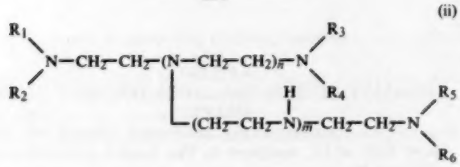
(b) about 0.1 to about 40 parts by weight of a polydentate amine per 100 parts of neutralized sulfonated polymer, said polydentate amine having a structure selected from the group consisting of:

(i)



and

(ii)



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen, and C_1 to C_{22} straight and branched chain alkyl groups, n being 1,2,3 or 4 and m being 0,1,2, or 3.

4,175,070
HIGH CARBON FRICTION MATERIAL

Bruce W. Klein, West Bloomfield, and Michael G. Jacko, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 2, 1978, Ser. No. 911,848

Int. Cl.[2] C08K *3/04, 3/08, 3/22*

U.S. Cl. 260—38 **12 Claims**

1. A friction material consisting of a mixture of:

20–33% by weight of fibers selected from a group consisting of glass fiber, asbestos and other mineral fibers;

4–22% by weight of metal or metal oxide particles;

0–7% by weight of organic modifiers;

7–24% by weight of inorganic modifiers;

18–34% by weight of carbon or graphite particles; and

8–14% by weight of a thermosetting phenolic resin,

said thermosetting phenolic resin being cured to form a matrix for holding the selected fibers, metal or metal oxide particles, the organic and inorganic modifiers and carbon or graphite particles in a fixed relationship, said carbon or graphite particles modifying the abrasive effect of said fibers on a mating surface to prevent degradation thereof.

4,175,071
TITANIUM DIOXIDE AS A U.V. SCREEN IN FIRE RETARDANT VINYL POLYMERS

Stephen Y. Chen, Elburn, and Thomas M. Quinn, St. Charles, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 772,109, Feb. 25, 1977, abandoned, which is a continuation of Ser. No. 635,032, Nov. 25, 1975, abandoned. This application Jul. 7, 1978, Ser. No. 922,543

Int. Cl.[2] C08K *3/22, 5/02*

U.S. Cl. 260—42.44 **6 Claims**

1. A method for producing a flame retardant, discoloration resisting styrene polymer composition comprising incorporating into said composition (1) a flame retarding amount of a halogenated organic compound which contains up to about 20 carbon atoms and forms a discolored product when incorporated into styrene polymers and exposed to ultraviolet radiation, and (2) a discoloration retarding amount of titanium dioxide.

4,175,072
LIGHT-COLORED UNSATURATED POLYESTER RESINS CONTAINING AT LEAST 2% BROMINE BY WEIGHT

Alan J. Parr, Bromborough, and Bryan O. Brown, Upton-by-Chester, both of England, assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed May 24, 1978, Ser. No. 909,009

Claims priority, application United Kingdom, Jul. 9, 1977, 28882/77

Int. Cl.[2] C08G *63/52, 63/68*

U.S. Cl. 528—299 **1 Claim**

1. A method for producing a light-colored unsaturated polyester resin containing at least 2% by weight bromine from polyols or alkylene oxides and polycarboxylic acids or anhydrides wherein at least 5 mol percent of the polyol ingredient is dibromo neopentyl glycol and wherein from 5 to 85 mol percent of the polycarboxylic acid or anhydride is tetrahydrophthalic acid or anhydride or endomethylene tetrahydrophthalic acid or anhydride

and wherein the polycarboxylic acid or anhydride also contains at least 10 mol percent of alpha-beta ethylenically unsaturated dicarboxylic acid or anhydride to yield an unsaturated polyester resin having a color which is lighter than the color of a corresponding unsaturated polyester resin which does not contain the tetrahydrophthalic acid or anhydride or endomethylene tetrahydrophthalic acid or anhydride.

4,175,073
REACTIVE DERIVATIVES OF HS-GROUP-CONTAINING POLYMERS

Jan P. E. Carlsson, Uppsala; Rolf E. A. V. Axén, Balinge; Hakan N. Y. Drevin, Brunna, and Goran E. S. Lindgren, Almunge, all of Sweden, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Filed Mar. 2, 1978, Ser. No. 882,547

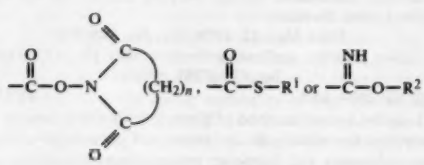
Claims priority, application Sweden, Mar. 4, 1977, 7702463

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 R **8 Claims**

1. A reactive derivative of an HS-group-containing polymer, wherein a number of HS-groups are converted to a disulphide group of the formula

where A is a hydrocarbon residue having 1–10 carbon atoms and Z is a group



or acid addition salts of the last mentioned group, where n is 2 or 3, R^1 is 2-pyridyl, 5-nitro-2-pyridyl or 4-pyridyl and R^2 is methyl or ethyl.

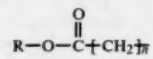
4,175,074

SERUM-SOLUBLE CHOLESTEROL COMPOUNDS AND METHOD FOR THEIR PREPARATION

Arvind D. Deshmukh, 1011 Pearl St., Santa Monica, Calif. 90405

Division of Ser. No. 716,615, Aug. 23, 1976, Pat. No. 4,040,784. This application Apr. 15, 1977, Ser. No. 787,737
Int. Cl.[2] C07G *7/00*; G01N *33/16*
U.S. Cl. 260—121 6 Claims

1. As a new composition of matter, a cholesterol ester conjugatively coupled to the amino residue of a peptide or protein, having as a functional component said ester



in which R is a cholesteryl radical and n is 0–3, said ester being soluble in serum in an amount equivalent to form at least 400 milligrams of cholesterol per 100 milliliters of cholesterol-free serum.

4,175,075

ISOLATION OF PROTEIN FROM VEGETABLE SEEDS

Charles M. Garrison, Fairfield; Rudolph W. Youngquist, and Harry M. Taylor, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 7, 1978, Ser. No. 922,919
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 19 Claims

1. A process for recovering vegetable seed protein granules from vegetable seed material, comprising suspending comminuted vegetable seed material having from about 10% to about 70% lipid and containing protein granules in an aqueous solution comprising an electrolyte selected from the group consisting of alkali metal halides and alkali metal phosphates, at a concentration greater than about 1%, and a carbohydrate, at a concentration greater than about 1%, said aqueous solution having a density of from about 1.1 to about 1.5 and a water activity of less than about 0.9, and, isolating the vegetable seed protein granules from the balance of the vegetable seed material.

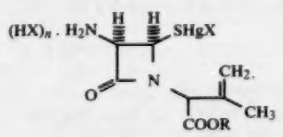
4,175,076

AZETIDINONE MERCURY SULFIDES AND PROCESS THEREFOR

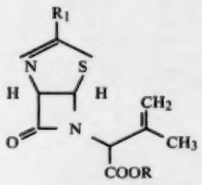
Lowell D. Hatfield, Bargersville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 21, 1977, Ser. No. 853,064
Int. Cl.[2] C07D *205/08*
U.S. Cl. 260—239 A 10 Claims

1. A process for preparing a compound of the formula



by reacting a compound of the formula



with about 1.0 to about 1.2 equivalents of a mercuric halide of the formula HgX_2 in an inert organic solvent in the presence of at least about an equivalent amount of a C_1 to C_8 primary or secondary alcohol or C_1–C_8 diol

wherein in the above formulas n is 1 or 0, X is chloro or bromo, R is hydrogen or a carboxylic acid ester protecting group and R_1 is

(a) C_1–C_4 alkyl or halo-C_1–C_4 alkyl;

(b) benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, tert-butoxy, benzhydryloxy, 4-methoxybenzyloxy;

(c) the group R_2 wherein R_2 is 1,4-cyclohexadienyl, phenyl or phenyl substituted with 1 or 2 substituents selected from the group consisting of chloro, bromo, iodo, hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl or C_1–C_4 alkoxy;

(d) an arylalkyl group of the formula

R_2—$(O)_m$—CH_2—

wherein R_2 is as defined above and m is 0 or 1; or

(e) a heteroarylmethyl group of the formula

R_3CH_2—

wherein R_3 is 2-thienyl, 3-thienyl, 2-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl, or 4-isoxazolyl.

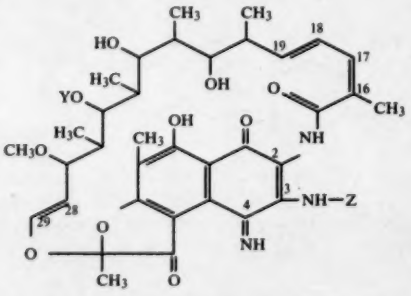
4,175,077

RIFAMYCIN COMPOUNDS

Vittorio Rossetti; Leonardo Marsili, and Carmine Pasqualucci, all of Milan, Italy, assignors to ARCHIFAR Industrie Chimiche del Trentino S.p.A., Rovereto, Italy

Filed Aug. 12, 1977, Ser. No. 825,163
Claims priority, application Italy, Sep. 30, 1976, 5209 A/76
The portion of the term of this patent subsequent to Apr. 12, 1994, has been disclaimed.
Int. Cl.[2] C07D *498/08*
U.S. Cl. 260—239.3 P 1 Claim

1. A rifamycin compound having the formula:

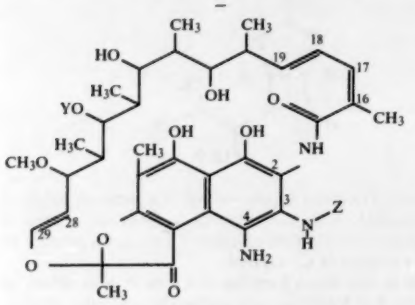


(II)

and 16, 17, 18, 19 tetrahydroderivatives and 16, 17, 18, 19, 28, 29 hexahydroderivatives thereof, wherein:

Y is —H or —$COCH_3$ and Z is an alkyl having 1 to 4 C atoms; cycloalkyl having 3 to 6 C atoms; phenyl; phenyl substituted with one radical selected from the group con-

sisting of halogen, methyl and hydroxy; and corresponding reduced compounds of formula:



(III)

and 16, 17, 18, 19 tetrahydroderivatives and 16, 17, 18 , 19, 28, 29 hexahydroderivatives thereof, wherein Y and Z are as above defined.

4,175,078

CARDENOLIDE AND BUFADIENOLIDE DERIVATIVES OF AJMALINE AND PROCESS FOR PRODUCING SAME

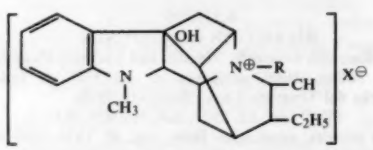
Ivan F. Makarevich; Yaroslav I. Khadzhai; Valeria V. Pavlova, and Anastasia V. Nikolaeva, all of Kharkov, U.S.S.R., assignors to Kharkovsky Naucho-Issledovatelsky Khimfo-Farmatsevtiches-Ky Institut, Kharkov, U.S.S.R.

Continuation-in-part of Ser. No. 880,694, Feb. 22, 1978, abandoned, which is a continuation of Ser. No. 735,211, Oct. 22, 1976, abandoned. This application Jul. 14, 1978, Ser. No. 924,922

Int. Cl.[2] **C07J** *19/00*

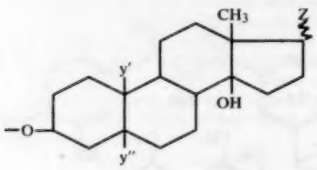
U.S. Cl. 260—239.57 **7 Claims**

1. The cardenolide and bufadienolide derivatives of ajmaline of the formula



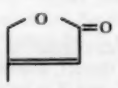
wherein

R is a steroid radical selected from the group consisting of cardenolide and bufadienolide of the formula

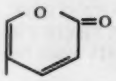


wherein

Z is an unsaturated lactone ring selected from the group consisting of a five-member unsaturated lactone ring of the formula



a six-member unsaturated lactone ring of the formula



y' is a radical selected from the group consisting of —CH_3, —CHO; y" is a substituent selected from the group consisting of hydrogen and a hydroxy group;

X is a halogen radical.

4,175,079

BENZODIAZEPINE DERIVATIVES

Yutaka Kuwada, Ashiya; Hideaki Natsugari, Itami, and Kanji Meguro, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 6, 1972, Ser. No. 295,575

Claims priority, application Japan, Oct. 21, 1971, 46-83476

Int. Cl.[2] **A61K** *31/55;* **C07D** *487/04*

U.S. Cl. 260—243.3 **3 Claims**

1. The compound 9-chloro-7-(2-chlorophenyl)-3,5-dihydro-1-methylpyrimido[1,2-a][1,4]benzodiazepin-3-one.

4,175,080

PROCESS OF PRODUCING 5'-HYDROXYLEUROSINE AND RELATED COMPOUNDS

Gerald L. Thompson; Gloria C. Paschal, and Robert A. Conrad, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 822,466, Aug. 8, 1977, Pat. No. 4,122,081. This application Aug. 2, 1978, Ser. No. 930,477

Int. Cl.[2] **C07D** *519/04*

U.S. Cl. 260—244.4 **2 Claims**

1. The process which comprises the steps of oxidizing 5'-hydroxyleurosine at −60° C. with CrO_3 in acetone and acetic acid to prepare 5'-hydroxy leuroformine, isolating the 5'-hydroxyleuroformine thus formed and then reducing said 5'-hydroxyleuroformine with sodium cyanoborohydride at ambient temperature to prepare leuroformine.

4,175,081

5-SUBSTITUTED THIADIAZOLE UREAS

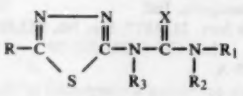
Patrick R. Driscoll, Spotswood, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 316,794, Dec. 20, 1972, which is a division of Ser. No. 296,389, Oct. 10, 1972, which is a continuation-in-part of Ser. No. 71,248, Sep. 10, 1970, abandoned, which is a division of Ser. No. 818,078, Apr. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 782,756, Dec. 10, 1968, abandoned, which is a continuation-in-part of Ser. No. 702,189, Feb. 1, 1968, abandoned. This application Dec. 22, 1977, Ser. No. 863,369

Int. Cl.[2] **A01N** *9/12;* **C07D** *285/12, 419/12*

U.S. Cl. 548—140 **3 Claims**

1. A compound of the formula



wherein R is alkoxyalkyl; R_1 is selected from the group consisting of H, alkyl (C_1–C_4), and cycloalkyl (C_3–C_6); R_2 is from the group consisting of H, alkyl (C_1C_4), haloalkyl (C_1–C_4), alkoxy (C_1–C_4), alkenyl (C_2–C_4), alkynyl (C_2–C_4), aryl, and haloaryl, and wherein R_1 and R_2 are alkylene which, together with N, form a ring of at least 3, but not more than 6 members; R_3 is H or alkyl ($C_{1\text{-}6}$); and X is selected from the group consisting of oxygen and sulfur.

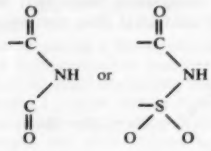
4,175,082

PROCESS FOR PREPARING N-CHLOROIMIDES

Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 19, 1977, Ser. No. 861,582
Int. Cl.[2] C07D *211/92, 217/24, 487/04, 209/48*
U.S. Cl. 260—326 C 15 Claims

1. A process for preparing an N-chloroimide which comprises the step of contacting the corresponding imide containing one or more of either or both of the moieties



and devoid of additional functional groups which would react under the conditions herein specified with molecular chlorine at a temperature of from about −10° C. to about +50° C. under substantially non-aqueous conditions and in the presence of

(1) an epoxy compound in an amount representing at least about one epoxy moiety per each imide moiety and (2) at least a catalytic amount of a catalytic transfer agent tertiary amine.

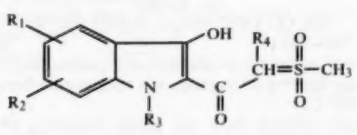
4,175,083

INDOLOPYRONES HAVING ANTIALLERGIC ACTIVITY

Richard E. Brown, Hanover, and Paul C. Unangst, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 890,544, Mar. 20, 1978, which is a continuation-in-part of Ser. No. 764,150, Jan. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 611,453, Sep. 8, 1975, Pat. No. 4,028,383. This application Sep. 8, 1978, Ser. No. 940,541
Int. Cl.[2] A61K *31/40;* C07D *209/04*
U.S. Cl. 260—326.12 R 3 Claims

1. A compound of the formula:



wherein R_1 and R_2 are hydrogen, hydroxy, halogen, trifluoromethyl, lower alkoxy or lower alkyl of 1 to 6 carbon atoms, or may be taken together to form a methylenedioxy group; wherein R_3 is hydrogen, lower alkyl of 1 to 6 carbons, phenyl, or phenylmethyl; and wherein R_4 is hydrogen.

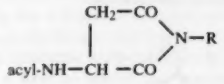
4,175,084

COUPLING PRODUCTS OF BIOLOGICALLY ACTIVE AMINES

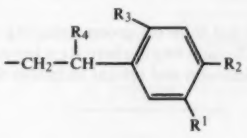
Jan B. Bøler, and Karl-Ludvig Reichelt, both of Oslo, Norway, assignors to Sentralinstitutt for Industriell Forskning, Oslo, Norway

Filed Jun. 27, 1977, Ser. No. 810,471
Claims priority, application Norway, Jun. 25, 1976, 762199
Int. Cl.[2] C07D *207/40*
U.S. Cl. 260—326.44 4 Claims

1. Physiologically active compounds characterized in that they are coupling products of the formula

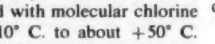


wherein "acyl" has the formula $C_xH_{2x+1}CO$ in which x is an integer from 0 to 17, and R is selected from the group consisting of the following formulas (a) and (b):



(a)

wherein R_1 is selected from the group consisting of H, OH and OCH_3, and R_2, R_3 and R_4 are each selected from the group consisting of H and OH, and



(b)

wherein R_7 is selected from the group consisting of H, OH, $CH_2—COOCH_3$, $CH_2—COOC_2H_5$ and a sulphonic ester group.

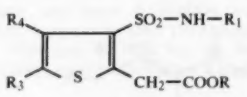
4,175,085

THIENOTHIAZINE DERIVATIVES

Dieter Binder; Otto Hromatka, both of Vienna, Austria; Rudolf Pfister, Basel, and Paul Zeller, Allschwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 767,016, Feb. 9, 1977, Pat. No. 4,090,070. This application Mar. 2, 1978, Ser. No. 882,723
Claims priority, application Austria, Feb. 23, 1976, 1268/76; Switzerland, Jan. 5, 1977, 83/77
Int. Cl.[2] C07D *333/24;* A01N *9/00*
U.S. Cl. 549—65 6 Claims

1. A compound of the formula



XIV

wherein R is lower alkyl, R_1 is lower alkyl, and R_3 and R_4, independently, are hydrogen or lower alkyl.

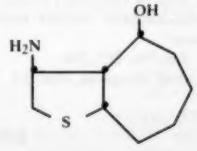
4,175,086

CYCLOHEPTATHIOPHENE DERIVATIVES

Pasquale N. Confalone; Elizabeth D. Lollar, both of Bloomfield; Giacomo Pizzolato, Belleville, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

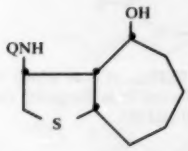
Division of Ser. No. 836,878, Sep. 26, 1977, Pat. No. 4,124,595, which is a division of Ser. No. 771,218, Feb. 23, 1977, Pat. No. 4,062,868. This application Jul. 31, 1978, Ser. No. 929,870
Int. Cl.[2] C07D *333/80*
U.S. Cl. 549—51 5 Claims

1. A compound of the formula:



the racemates and optical antipodes thereof.

2. A compound of the formula:



wherein Q is selected from the group consisting of $—CO_2R_4$, $—COR_4$, $—COCX_3$, and tosyl, where R_4 is lower alkyl and X is halogen, the racemates and optical antipodes thereof.

4,175,087

α,β-UNSATURATED KETONES AND ALDEHYDES AND METHOD OF PREPARATION

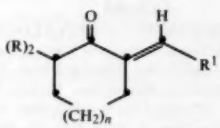
Riaz F. Abdulla, and Kenneth H. Fuhr, both of Greenfield, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 12, 1978, Ser. No. 868,774

Int. Cl.[2] C07C *47/45*

U.S. Cl. 260—586 R **4 Claims**

1. A process for preparing 2-alkylidene ketones of the formula



(I)

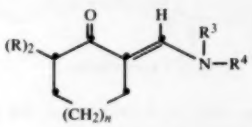
wherein

R is hydrogen or C_1–C_2 alkyl;

R^1 is C_1–C_7 alkyl; and

n is 0 or 1,

which comprises allowing an enaminoketone of the formula



(V)

wherein R and n represent the same values as above, and R^3 and R^4 are C_1–C_2 alkyl, to react with a C_1–C_7 alkyllithium in the presence of a solvent at a temperature of from about −50° to about 25° C. for a period of from about 2 to about 12 hours.

4,175,088

PROCESS FOR THE PRODUCTION OF [1,1-DITHIENYL-(3)-1-HYDROXYPROPYL-(3)]-[1-PHENYL-1-HYDROXYPROPYL-(2)]-AMINE AND [1,1-DITHIENYL-(3)-PROPEN-(1)-YL-(3)]-[1-PHENYL-PROPYL-(2)]-AMINE

Axel Kleemann; Reinhold Kiel, both of Hanau, and Ingomar Nubert, Offenbach, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

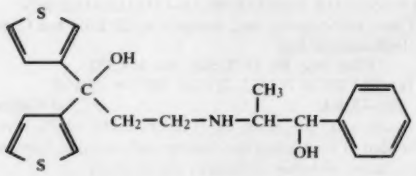
Filed Jan. 5, 1978, Ser. No. 867,294

Claims priority, application United Kingdom, Jan. 12, 1977, 1120/77

Int. Cl.[2] C07D *333/16*

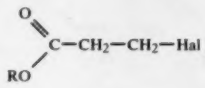
U.S. Cl. 549—59 **8 Claims**

1. A process for the production of



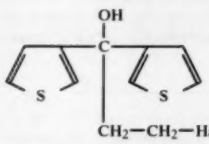
(I)

which comprises condensing thien-(3)-yl lithium with a β-halogen propionic acid alkyl ester corresponding to the formula



(II)

in which R is a lower alkyl group and Hal is chlorine, bromine or iodine, in an inert medium at a temperature below −50° C., and then reacting the resulting compound corresponding to the formula



(III)

with 2-amino-1-hydroxy-1-phenylpropane in an inert medium in the presence of a base or hydrogen halide acceptor.

4,175,089

PREPARATION OF GAMMA-BUTYROLACTONES

El Ahmadi I. Heiba, Princeton, and Ralph M. Dessau, Highland Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 30,582, Apr. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 714,447, Mar. 20, 1968, abandoned. This application Feb. 28, 1973, Ser. No. 336,857

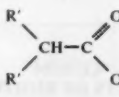
Int. Cl.[2] C07D *307/32, 307/83, 307/93*

U.S. Cl. 260—343.6 **14 Claims**

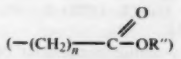
1. A method for the production of a gamma-butyrolactone comprising the step of reacting, at a temperature between 20° C. and 250° C.:

an olefin selected from the group consisting of acyclic monoolefins having 2 to 92 carbon atoms, acyclic diolefins having 3 to 8 carbon atoms, cyclic monoolefins having 5 to 8 carbon atoms and cyclic diolefins having 5 to 8 carbon atoms;

an acid having the formula



wherein one or both of the R's are selected from the group consisting of hydrogen, straight or branched chain alkyl or alkenyl group having one to ten carbon atoms, cyano and alkyl carboxy having the formula



wherein R'' is hydrogen or CH_3 and n has a value of one to six; and

at least two equivalents per mole of said olefin of an ion of manganese or cerium, the ion being in a valency state higher than its lowest valency state.

4,175,090

CHEMICAL COMPOSITION

David Berry, North Humberside, England, assignor to BP Chemicals Limited, London, England

Filed Feb. 23, 1978, Ser. No. 880,476

Int. Cl.[2] C07F *1/08*

U.S. Cl. 260—438.1 **2 Claims**

1. A process for preparing a homogeneous liquid composition comprising a cuprammonium complex of one or more C_1–C_4 monocarboxylic acids containing between 4 and 10% by weight of dissolved copper and up to 40% by weight of water, said process comprising reacting an acid ammonium salt of the monocarboxylic acid with a copper compound selected from cupric oxide and cuprous oxide in the presence of aqueous ammonia.

4,175,091

SUBSTITUTED 3,1-BENZAZASILINES

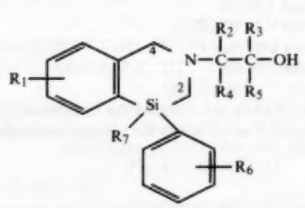
Sandor Barcza, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 27, 1978, Ser. No. 881,687

Int. Cl.[2] C07F *7/10*

U.S. Cl. 260—448.2 N **3 Claims**

1. A compound of the formula



(I)

where

R_1 represents H or alkyl of 1–5 carbon atoms,

R_2, R_3, R_4 and R_5 each, independently, represent H or alkyl of 1–2 carbon atoms,

R_6 represents H, alkyl of 1–5 carbon atoms, halo having an atomic weight of about 19–36, alkoxy having 1–5 carbon atoms, or

where

R_8 and R_9 each, independently, represent alkyl having 1–2 carbon atoms, and

R_7 represents alkyl having 1–5 carbon atoms.

4,175,092

EXTRACTION PROCESS

Pieter M. Bakker, and Cornelis E. Kind, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

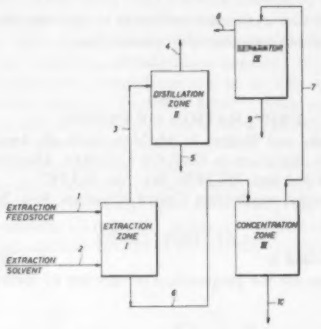
Continuation-in-part of Ser. No. 856,811, Nov. 30, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,958

Claims priority, application United Kingdom, Nov. 30, 1976, 49831/76

Int. Cl.[2] C07C *141/04, 143/02*

U.S. Cl. 260—456 R **10 Claims**

1. A process for recovering non-surface active material from an aqueous based mixture containing water, surface active organic salts comprising sulphated or sulphonated organic matter, and non-surface active organic material, said mixture being obtained by the sulphation or sulphonation of C_8 to C_{22} olefins, paraffins or alcohols to yield the corresponding monoalkyl sulphuric or sulphonic acids followed by neutralization of said acids with a base to afford the corresponding surface active organic salts, which comprises extracting the aqueous-based mixture with, as sole solvent, a C_6 ketone, at a temperature of below 60° C., or an alkyl acetate in which the alkyl



grouping contains one to six carbon atoms to form a ketone or alkyl acetate based extract phase containing essentially all of the non-surface active organic matter and a raffinate phase containing water, some of the ketone or acetate solvent and essentially all of the sulphated or sulphonated organic matter, and subsequently separating the extract phase into a ketone or acetate fraction and a non-surface active organic material fraction which is recycled to the sulphation or sulphonation reaction.

4,175,093

PREPARATION OF α-CYANO ESTERS

Arend Reinink, and Roger A. Sheldon, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

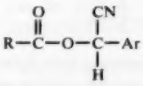
Filed Sep. 25, 1978, Ser. No. 945,716

Claims priority, application United Kingdom, Sep. 28, 1977, 40335/77

Int. Cl.[2] C07C *120/00, 121/66*

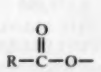
U.S. Cl. 260—465 D **30 Claims**

1. In a process for the preparation of an ester of formula I

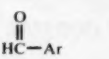


(I)

wherein Ar represents a phenyl group substituted at the 3-position by a phenoxy, a phenylthio or a benzyl group, and



represents the residue of a pyrethroid acid, in which process an aromatic aldehyde of formula II



(II)

wherein Ar has the same meaning as in formula I, is treated with an acid halide of formula III

(III)

wherein R has the same meaning as in formula I, and X is a halogen atom having an atomic number of from 9 to 53, inclusive, in the presence of water and a water-soluble cyanide and optionally in the presence of a phase-transfer catalyst the improvement comprising restarting a stalled reaction by addition of an alkaline compound selected from alkali metal carbonates and hydroxides in an amount sufficient to increase the pH of the aqueous phase and generate cyanide ions.

4,175,094

PREPARATION OF ESTERS

Arend Reinink, and Roger A. Sheldon, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

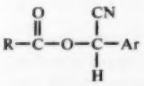
Filed Sep. 25, 1978, Ser. No. 945,717

Claims priority, application United Kingdom, Sep. 28, 1977, 40335/77

Int. Cl.[2] **C07C** *120/00*

U.S. Cl. 260—465 D **29 Claims**

1. A process for the preparation of an ester of formula I



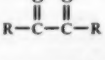
(I)

wherein Ar represents a phenyl group substituted at the 3-position by a phenoxy, a phenythio or a benzyl group and

represents the residue of a pyrethroid acid anhydride, which process comprises treating an aromatic aldehyde of formula II

(II)

wherein Ar has the same meaning as in formula I, with an acid anhydride of formula III



(III)

wherein R has the same meaning as in formula I, in the presence of water and a water-soluble cyanide and a phase transfer catalyst.

4,175,095

PROCESS FOR THE MANUFACTURE OF PENTACHLOROVINYLACETYL CHLORIDE

Günther Maahs, and Konrad Rombusch, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls, A.G., Marl, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,299

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754670

Int. Cl.[2] **C07C** *57/02, 51/58*

U.S. Cl. 260—544 Y **10 Claims**

1. A method of preparing pentachlorovinylacetyl chloride which comprises chlorinating tetrachlorocyclobutenone with a chlorinating agent.

4,175,096

ALKOXYLATED PERFLUOROALKANESULPHONAMIDES

Gunther Reitz, Cologne, and Günther Boehmke, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

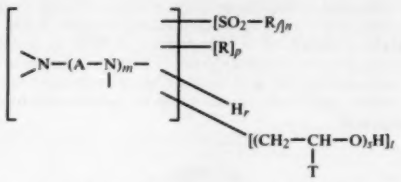
Filed Aug. 30, 1977, Ser. No. 829,145

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639473

Int. Cl.[2] **C07C** *143/70, 143/74*

U.S. Cl. 260—556 F **4 Claims**

1. Alkoxylated perfluoroalkanesulphonamide of the formula



and its quaternization product wherein

R_f is C_1–C_{18} perfluoralkyl;

A is C_2–C_8-alkylene;

R is C_1–C_8-alkyl;

T is hydrogen or methyl;

m is a number from 2 to 10;

n is a number from 1 to m;

p is a number from 0 to m+2;

r is a number from 0 to m+1;

s is a number from 2 to 50;

t is a number from 1 to m+2; and

the sum of n+p+r+t is m+3 when the compound is not quaternized and is 2 m+3 when the compound is quaternized.

4,175,097

BIS(DIMETHYLAMINOPROPYL)-AMINE DERIVATIVES AS POLYURETHANE CATALYSTS

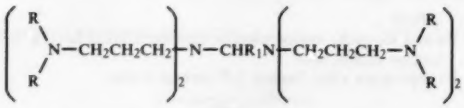
Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Division of Ser. No. 746,577, Dec. 1, 1976, Pat. No. 4,101,466. This application Oct. 21, 1977, Ser. No. 844,240

Int. Cl.[2] **C07C** *87/28, 93/02*

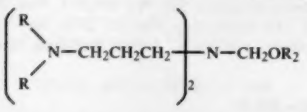
U.S. Cl. 260—570.5 P **5 Claims**

1. A compound of the formula:



where R is lower alkyl and R_1 is hydrogen, alkyl or aryl.

2. A compound of the formula:



where R is lower alkyl and R_2 is alkyl.

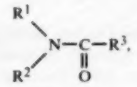
4,175,098

METHOD FOR THE PREPARATION OF α-TETRALONE

Fujio Mizukami, Urawa, and Juichi Imamura, Chofu, both of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jul. 6, 1978, Ser. No. 922,462
Claims priority, application Japan, Jul. 7, 1977, 52/81153
Int. Cl.[2] C07C 45/02
U.S. Cl. 260—590 FA 6 Claims

1. A method for the preparation of α-tetralone which comprises oxidizing tetralin with oxygen in a homogeneous liquid phase at a temperature in the range from 30° to 150° C. in the presenc of a binary catalyst dissolved therein composed of a metal component selected from the class consisting of chromium compounds and cobalt compounds soluble in the reaction mixture in a concentration in the reaction mixture of at least 0.0005 mole/liter and an N,N-dialkyl substituted carboxylic acid amide represented by the general formula



where R^1 and R^2 each are alkyl groups having 1 to 4 carbon atoms and R^3 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

4,175,099

SEPARATION AND RECOVERY OF ETHYLBENZENE FROM C_8 AROMATIC MIXTURES USING RUBIDIUM-X SIEVES

Paul R. Geissler, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 7, 1975, Ser. No. 556,434
Int. Cl.[2] C07C 7/13
U.S. Cl. 585—831 10 Claims

1. In a process for separating ethylbenzene from a mixture of C_8 aromatic isomers wherein said mixture is contacted with an adsorbent which selectively adsorbs ethylbenzene under adsorbtion conditions, the improvement which comprises employing as said adsorbent an X-structured zeolite containing exchangeable cationic sites, said cations consisting essentially of rubidium and sodium and wherein said rubidium has been exchanged for at least about 10 percent of the exchangeable sodium cations.

4,175,100

PREPARATION OF ANIONIC POLYMERS FOR USE AS SCALE INHIBITORS AND ANTI-PRECIPITANTS

Arthur M. Schiller, Stamford; Richard M. Goodman, Norwalk, and Roger E. Neff, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 735,310, Oct. 26, 1976, Pat. No. 4,072,607. This application Dec. 22, 1977, Ser. No. 863,565
Int. Cl.[2] C08F 220/06; C08L 33/02
U.S. Cl. 525—327 5 Claims

1. A composition of matter consisting essentially of a blend of copolymers of from about 95 to 50 mol percent acrylic acid and, correspondingly, about 5 to 50 mol percent acrylamide, said copolymers consisting of a skewed molecular weight distribution such that on a gel permeation chromatograph at least about 60% of said copolymers have a molecular weight of about 500 to 2,000, at least about 10% of said copolymers have a molecular weight of about 4,000 to 12,000 and any balance of said copolymers have a molecular weight of about 500 to 12,000.

4,175,101

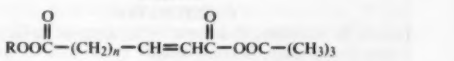
ACRYLONITRILE BLOCK TERPOLYMER BARRIER RESINS

Kenneth C. Benton, Bedford Heights, and Timothy J. Williamson, Cuyahoga Falls, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Nov. 14, 1977, Ser. No. 850,988
Int. Cl.[2] C08F 293/00
U.S. Cl. 525—88 9 Claims

1. The block polymeric composition resulting from the stepwise

(A) polymerization of an acrylate ester or a mixture of at least 50% by weight of a diene monomer selected from the group consisting of butadiene, isoprene, chloroprene and 2,3-dimethyl-1,3-butadiene, and up to 50% by weight of a member selected from the group consisting of styrene, acrylonitrile, methacrylonitrile, an acrylic ester or a methacrylic ester, with a multi-functional sequential free-radical initiator selected from the group consisting of di[1,3-dimethyl-3-(t-butyl peroxy) butyl] peroxy dicarbonate, 2,5-dimethyl-2-t-butyl peroxy-5-hydro peroxy hexane, 1,3-dimethyl-3-(t-butyl peroxy) butyl-4-t-butyl)-azo-4-cyanovalerate, di-t-butyl-4,4'-azobis(4-cyano peroxy valerate),



wherein n is 5 to 9 and R is alkyl, aryl or hydrogen and then

(B) using some of (A) as the sole polymerization initiator copolymerizing

(1) from 25 to 90% by weight of acrylonitrile and correspondingly

(2) from 10 to 75% by weight of a comonomer selected from the group consisting of methyl acrylate, ethyl acrylate, the propyl acrylates, the butyl acrylates, methyl methacrylate, ethyl methacrylate, the propyl methacrylates, the butyl methacrylates, styrene, alpha-methyl styrene, indene, isobutylene, vinyl acetate, vinyl methyl ether, and vinyl ethyl ether,

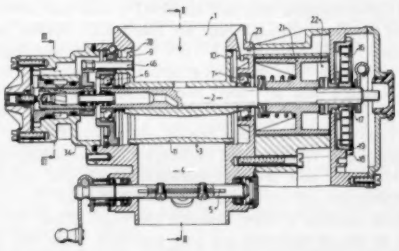
wherein there are employed from 5 to 30 parts by weight of (A) per 100 parts by weight of (B).

4,175,102

FUEL SUPPLY DEVICE

Max Greiner, Gerlingen; Klaus J. Peters, Affalterbach; Peter Schelhas, Stuttgart; Peter Stiefel, Ditzingen, and Hermann Nusser, Asperg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 897,985
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720336
Int. Cl.[2] F02M 7/22
U.S. Cl. 261—50 A 6 Claims



1. A fuel supply device for mixture-compressing, externally ignited internal combustion engines provided with an arbitrar-

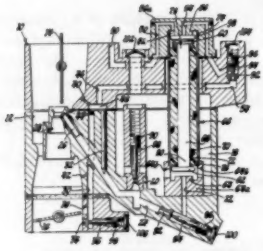
ily activatable throttle member arranged in the air intake manifold, a fuel metering device, a rotatable air metering member associated with said throttle member adapted to actuate said fuel metering device, means for applying a return force to the air metering member that corresponds to the air flow rate, said air metering member being deflectable against said return force for actuation of said fuel metering device, said fuel metering device including a guide sleeve having a control slit, a rotatable sleeve having a control groove positioned within said guide sleeve, and arbitrarily slidable relative to said guide sleeve, said control groove being arranged to open said control slit to a greater or lesser degree and to thereby meter the fuel to a nozzle so as to be injected into the air intake manifold, coupling means for transferring the movement of said rotatable air metering member to said rotatable sleeve, secondary sleeve means for interconnecting said air metering member and said rotatable sleeve, said secondary sleeve means being arranged to receive the fuel to be fed to said nozzle, said control groove having at least one control edge portion which overlaps said control slit and is formed at an angle to the axis of rotation of said rotatable sleeve whereby said control groove is both rotatable and slidable relative to said control slit.

4,175,103

CARBURETOR

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 896,684, Apr. 17, 1978, abandoned. This application Nov. 9, 1978, Ser. No. 959,104
Int. Cl.[2] F02M *7/18*
U.S. Cl. 261—50 R **12 Claims**



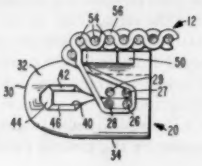
1. A carburetor comprising main and idle fuel passages, a metering orifice in said main fuel passage, an air bleed opening into said idle fuel passge, and a metering apparatus reciprocable between a rich position and a lean position, said metering apparatus including a metering valve engaged with said metering orifice in said lean position to restrict fuel flow through said main fuel passage and displaced from said metering orifice in said rich position to permit increased fuel flow through said main fuel passage, said metering apparatus further including a bleed valve engaged with said air bleed in said rich position to restrict air flow through said air bleed and thereby permit increased fuel flow through said idle fuel passage and displaced from said air bleed in said lean position to permit increased air flow through said air bleed and thereby restrict fuel flow through said idle fuel passage, wherein said valves are magnetically responsive and at least one of said valves is permanently magnetic, and wherein said carburetor further comprises an electromagnet pole member associated with said valves, an electromagnet coil surrounding said pole member for causing said pole member to repel said one valve and attract the other valve to one of said rich and lean positions when said coil is energized and for causing said pole member to attract said one valve to the other of said rich and lean positions when said coil is deenergized, and means for biasing said other valve to said other positions when said coil is deenergized.

4,175,104

MOLDED ELEMENT TAPE SUPPORT FOR INVISIBLE SLIDE FASTENER AND METHOD OF MANUFACTURE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 724,222, Sep. 17, 1976, Pat. No. 4,080,691. This application Feb. 13, 1978, Ser. No. 877,531
Int. Cl.[2] B29D *5/00*
U.S. Cl. 264—103 **8 Claims**



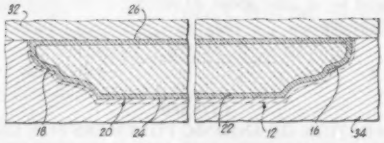
1. A method of forming a slide fastener stringer comprising the steps of joining a plurality of spaced coupling elements having a body to at least one connecting thread, forming wing portions on an upper surface of each body, bending the wing portions of each body toward the wing portions of the next body thereby forming a substantailly continuous linear tape support, weaving a woven tape to each body with threads thereof overlying and covering the wing portions with selected ones of said threads being secured to said connecting thread for uniting the body, the tape and said connecting thread together thereby concealing the linear support and coupling elements.

4,175,105

POST-PRESS MOLDING OF MAN-MADE BOARDS TO PRODUCE CONTOURED FURNITURE PARTS

Allan J. Luck, Marengo; John T. Clarke, and Michael R. Hoffman, both of St. Charles, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 739,184, Nov. 5, 1976. This application Jul. 28, 1977, Ser. No. 819,876
The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.
Int. Cl.[2] B29J *5/04*
U.S. Cl. 264—112 **15 Claims**



1. A method of molding a cellulosic fiber contoured board having a skin on at least one surface, comprising:

(a) compressing a cellulosic fibrous mat to form a consolidated, handleable blank having a density of less than 35 pounds/cubic foot;

(b) cutting the consolidated blank to a shape slightly larger in at least two dimensions than corresponding interior dimensions of a closed, contoured mold cavity;

(c) applying to at least one surface of said blank a solution of urea in an amount of at least 5% by weight urea based on the dry weight of the surface fibers penetrated by said solution;

(d) inserting said cut blank in the open cavity of said mold;

(e) closing said mold;

(f) pressing said blank at a temperature of 525°–650° F. to reshape said blank in at least two dimensions to the dimensions of the contoured mold cavity to form a contoured

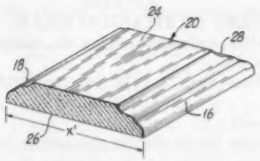
board and form a skin having a density and hardness exceeding the density and hardness of the material thereunder on said surface contacted with said urea solution;
(g) opening said mold; and
(h) removing said contoured board.

4,175,106

POST PRESS MOLDING OF MAN-MADE BOARDS TO PRODUCE CONTOURED FURNITURE PARTS

John T. Clarke, St. Charles; Allan J. Luck, Marengo, and Roger F. Sutton, St. Charles, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Sep. 14, 1977, Ser. No. 833,037
Int. Cl.[2] B29J *5/00*
U.S. Cl. 264—118 **10 Claims**



1. A method of molding a cellulosic fiber containing board to form a three dimensional contoured part comprising:
(a) compressing and heating a fibrous mass of cellulosic fibers to bond the fibers into a consolidated blank;
(b) cutting the consolidated blank to a shape having a plurality of generally tapered edges and corresponding generally to the interior shape of a closed, contoured mold cavity wherein said cut blank is slightly larger than the interior dimensions of said mold cavity in each of its three dimensions;
(c) inserting said cut blank in the open cavity of said contoured mold;
(d) closing said mold;
(e) hot-pressing said consolidated, cut blank in said mold at a temperature of 500° F. to 650° F. to reshape the blank in all three of its dimensions to form a contoured, molded product; and
(f) opening said mold and removing said molded, contoured part.

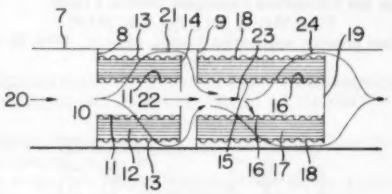
4,175,107

CATALYTIC EXHAUST GAS PURIFYING DEVICE

Kazuo Iwaoka; Tagao Toh, both of Toyonaka, and Minoru Fukada, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 605,395, Aug. 18, 1975, abandoned. This application May 5, 1977, Ser. No. 794,115
Claims priority, application Japan, Sep. 3, 1974, 49-101516; Sep. 3, 1974, 49-106251[U]; Dec. 20, 1974, 49-147448; Jun. 2, 1975, 50-74986[U]
Int. Cl.[2] B01J *8/02, 35/04;* **F01N** *3/15*
U.S. Cl. 422—114 **7 Claims**

1. A catalytic converter for purifying the exhaust gases from an internal combustion engine, comprising:
a tubular metallic casing having an exhaust gas inlet port at one end and an exhaust gas outlet port at the other end;
a first catalyst stage disposed within said casing, said stage comprising:
a perforated metallic inner tube generally coaxial with said casing and forming an interior conduit communicating with said inlet and outlet ports;
a ring shaped metallic end disk adjacent said inlet port and extending between and connected to a front end of said tube and the interior wall of said casing for supporting said tube in said generally coaxial relationship to said casing, so that said inlet port may communicate exhaust gases through the opening in the disk to the inlet end of the perforated tube;
a metallic shielding disk adjacent said outlet port and connected between a rear end of said tube and said casing for supporting said tube in said generally coaxial relationship to said casing, said shielding disk partially extending radially into said interior conduit to restrict the passage of exhaust gas through said conduit and having an opening communicating with said conduit through which one portion of said exhaust gas may flow;
at least one layer comprising catalytic material supported by said inner tube between said disks and disposed between said tube and said casing;
said shielding disk having an apertured part adjacent said casing for permitting another portion of said exhaust gas to flow therethrough, said one portion of said exhaust gas bypassing said catalyst layer and at least a part of said other exhaust gas portion passing through said layer;
at least one intermediate catalyst stage disposed within said casing downstream of said first stage, said intermediate stage comprising:
a perforated metallic inner tube generally coaxial with said casing and forming an interior conduit communicating with said inlet and outlet ports;
a ring shaped metallic end disk adjacent said inlet port and extending between and connected to a front end of said tube of said intermediate stage and the interior wall of said casing for supporting said tube of said intermediate stage in said generally coaxial relationship to said casing, so that said inlet port may communicate exhaust gases through



the opening in the disk of said intermediate stage to the inlet end of the perforated tube of said intermediate stage;
a metallic shielding disk adjacent said outlet port and connected between a rear end of said tube of said intermediate stage and said casing for supporting said tube of said intermediate stage in said generally coaxial relationship to said casing, said shielding disk of said intermediate stage extending radially into said interior conduit of said intermediate stage to restrict the passage of exhaust gas through said conduit of said intermediate stage and having an opening communicating with said conduit of said intermediate stage through which one portion of said exhaust gas may flow;
at least one layer comprising catalytic material supported by said inner tube of said intermediate stage between said disks of said intermediate stage and disposed between said tube of said intermediate stage and said casing of said intermediate stage;
said shielding disk of said intermediate stage having an apertured part adjacent said casing for permitting another portion of said exhaust gas to flow therethrough, said one portion of said exhaust gas bypassing said catalyst layer of said intermediate stage and at least a part of said other exhaust gas portion passing through said layer of said intermediate stage;
a final catalyst stage disposed within said casing and downstream of said at least one intermediate catalyst stage, said final stage comprising:
a final perforated metallic inner tube generally coaxial

with said casing and having a final interior conduit communicating with said inlet and outlet ports;

a final ring shaped metallic end disk adjacent said inlet port of said final tube and extending between a front end of said final tube and said casing for supporting said final tube in said generally coaxial relationship to said casing;

a final metallic shielding disk adjacent said outlet port of said final tube and extending between a rear end of said final tube and said casing for supporting said final tube in said generally coaxial relationship to said casing,

said final tube cooperating with said casing to form a first interior cylindrical gas flow path and a second exterior annular exhaust gas flow path,

said shielding disk of said final stage having a substantially imperforate part covering said interior gas flow path for blocking only one of said exhaust gas flow paths;

at least one second layer comprising catalytic material supported by said final inner tube between said disks of said final stage and disposed between said final tube and said casing;

said end disk of said final stage being spaced apart from said shielding disk of said intermediate stage adjacent thereto to define a combining region for said exhaust gas portions, said end disk of said final stage having a substantially imperforate part for blocking one end of said second exterior annular exhaust gas flow path, so that substantially all of said exhaust gas is caused to flow through said final catalytic layer.

4,175,108

PROCESS FOR EXTRACTING URANIUM FROM ORES

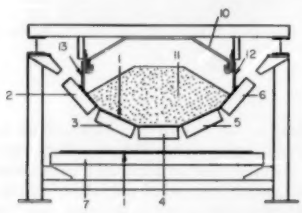
Jacques Poitte, Rambouillet, France, assignor to Societe Technique des Entreprises Chimiques, Sevres, France

Filed May 4, 1977, Ser. No. 793,553

Claims priority, application France, May 31, 1976, 76 17171

Int. Cl.[2] C01G *43/00*

U.S. Cl. 423—20 **9 Claims**



1. In a process for extracting uranium from uranium ore wherein the ore is first crushed so that a substantial portion of the grains are of a dimension not less than 0.1 mm, the improvement comprising the steps of sequentially

(a) mixing the crushed ore with an attacking reagent, the volume of which is less than that required to produce a continuous liquid phase,

(b) placing the mixture of crushed ore and attacking reagent on at least one conveyor belt at a predetermined temperature and humidity and allowing it to reside thereon for at least 1 hour, and

(c) extracting the solubilized uranium from the mixture by washing.

4,175,109

PROCESS FOR EXTRACTING TUNGSTEN FROM ALKALI METAL TUNGSTATE SOLUTIONS

Tai K. Kim, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 3, 1978, Ser. No. 930,784

Int. Cl.[3] C01G *41/00*

U.S. Cl. 423—54 **2 Claims**

1. In a process wherein tungsten values are extracted from an aqueous alkali metal tungstate solution containing impurities by an organic extractant solution containing an amine extractant and thereafter the tungste values are removed from the organic extractant solution by stripping with aqueous ammonia, wherein the improvement comprises providing, as an extractant, an organic extraction solution consisting essentially of from about 6 to about 10 percent by volume of a mixture of tri-alkyl amines having alkyl chains of about 6 to 10 carbon atoms with trisooctyl amine being the major component in said mixture and from about 90 to 94 percent by volume of an aromatic solvent consisting essentially of a mixture of alkyl benzenes wherein the alkyl benzenes constituting the mixture of alkyl benzenes have molecular weights of 120, 134 or 148 and the total number of carbon atoms in the alkyl chains attached to the benzene ring are either 3, 4 or 5.

4,175,110

RECOVERY OF TITANIUM METAL VALUES

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 22, 1978, Ser. No. 935,812

Int. Cl.[2] C01G *23/04*

U.S. Cl. 423—83 **5 Claims**

1. In a process for producing titanium metal values from a titanium bearing source which comprises the steps of:

(a) crushing said titanium bearing source;

(b) subjecting said crushed source to a reductive roast at a temperature in the range of from about 600° up to about 1000° C. in the presence of a reducing medium selected from the group consisting of hydrogen gas, carbon monoxide gas, and combinations thereof;

(c) leaching said reduced source of step (b) with a hydrogen halide leach solution at a temperature in the range of from about ambient up to about 110° C. to solubilize titanium and iron halides;

(d) separating the solid gangue produced in step (c) from said soluble metal chlorides;

(e) cooling said soluble metal halides to a temperature in the range of from about 0° C. to as high as 90° C. to precipitate ferrous chloride;

(f) treating the leach liquor of step (e) after said ferrous chloride precipitation with ferric oxide at a temperature in the range of from about 70° to about 100° C. to nucleate said titanium halide to a titanium dioxide precipitate; and

(g) recovering said precipitated titanium dioxide, the improvement which comprises the treatment of said leach liquor in step (f) with a stoichiometric excess of said ferric oxide in the range of from about 2.5 to about 50 times the stoichiometric amount of ferric oxide required to react with the titanium halide of said leach liquor while concomitantly maintaining said leach liquor in an agitated state, recovering solids, mixing said solids with a second leach solution containing sufficient titanium halide to consume the remaining ferric oxide and recovering the resultant titanium dioxide.

4,175,111

REMOVAL OF PHOSPHINE FROM PHOSPHINE-CONTAMINATED CARBON MONOXIDE GAS STREAMS

Theodore F. Munday, Kendall Park, and John Walden, Hightstown, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

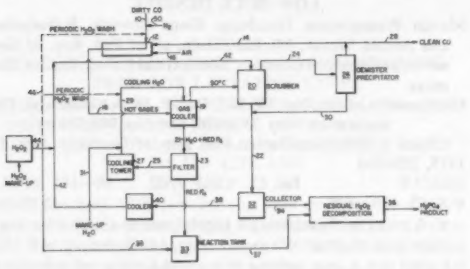
Filed Dec. 14, 1977, Ser. No. 860,377

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—210 **3 Claims**

1. The process of removing phosphine from the off gas stream obtained after condensing phosphorus from the overhead stream from phosphorus producing furnaces, which gas stream is a mixture of gases containing over 90% of CO and less than 1% PH_3, which comprises heating said gas stream to a temperature of 700° C. to 800° C. for a time sufficient to

substantially completely decompose the phosphine to red phosphorus and hydrogen, and then separating the red phosphorus from the gas stream, now substantially free of phosphine.



4,175,112
PROCESS FOR PURIFICATION OF GASES CONTAINING ELEMENTAL SULFUR

Edwin B. Lusk, Plaquemine; Douglas C. Riley, Jr., and Joseph P. Creadh, III, both of Baton Rouge, all of La., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 17, 1978, Ser. No. 925,125
Int. Cl.[2] C01B *17/00, 17/48*
U.S. Cl. 423—242 **9 Claims**

1. A process for the purification of a sulfur dioxide containing gas containing as an impurity elemental sulfur comprising:
(a) contacting the gas with sulfur trioxide and
(b) introducing the gas now containing sulfur trioxide into a pool of oleum having an acidity of about 101% to about 108% maintained at a temperature of from about 180° F. to about 250° F. whereby elemental sulfur contained in the gas is converted into additional sulfur dioxide.

4,175,113
PURIFICATION OF CRUDE CHLOROPHOSPHAZENE COMPOUNDS BY TREATMENT WITH WATER

John W. Fieldhouse, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 20, 1978, Ser. No. 897,993
Int. Cl.[2] C01B *25/10*
U.S. Cl. 423—300 **5 Claims**

1. A process for the purification of crude chlorophosphazene which comprises the steps in sequence of:
(a) subjecting the crude chlorophosphazene to at least two water-washings performed at room temperature and under agitation, wherein following each water-washing the water is removed from the chlorophosphazene;
(b) drying the chlorophosphazene under vacuum at room temperature; and
(c) subjecting the chlorophosphazene to a final purification by distillation, recrystallization, sublimation or melting and filtering.

4,175,114
METHOD FOR PRODUCING ZEOLITES

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 650,481, Jan. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 424,481, Dec. 13, 1973, abandoned. This application Oct. 13, 1977, Ser. No. 841,622
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—329 **12 Claims**

1. In a method of synthesizing a crystalline aluminosilicate ZSM-5 zeolite from a reaction mixture comprising water, sources of silicate, alumina and alkali metal, the improvement whereby the zeolite is synthesized in a reaction mixture consisting essentially of said sources and a member selected from the group consisting of (1) ZSM-5 seeds, (2) mixtures of ZSM-5 seeds with alcohol, (3) mixtures of ZSM-5 seeds with alcohol and ammonium hydroxide, and (4) mixtures of ZSM-5 seeds with ammonium hydroxide to yield a zeolite ZSM-5 product containing no more than about 0.2% by weight of organic nitrogen.

4,175,115
PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS BY THE CATALYZED DECOMPOSITION OF METHANOL

William J. Ball, Capel, and David G. Stewart, Epsom, both of England, assignors to The British Petroleum Company Limited, London, England

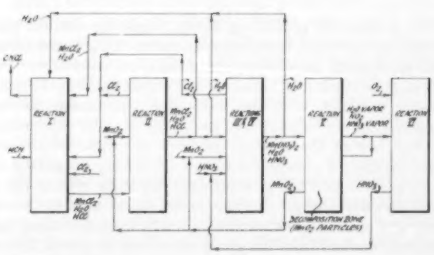
Filed May 26, 1978, Ser. No. 909,979
Claims priority, application United Kingdom, Jul. 27, 1977, 31538/77
Int. Cl.[2] C01B *31/18, 1/13*
U.S. Cl. 423—415 A **19 Claims**

1. A process for the production of hydrogen and carbon monoxide comprising contacting essentially anhydrous methanol in the vapor phase with a supported catalyst at a temperature in the range of about 200° to 600° C., a pressure in the range of from about 0 to 50 atmospheres and a contact time up to 30 seconds, said supported catalyst containing a metal of Group VIII of the Periodic Table and another metal of Group IB, Group II, Group VIB or Group VIII of the Periodic Table, excluding binary combinations of copper and nickel, and said metals constituting from 0.1 to 20% by weight of said catalyst.

4,175,116
NON-ELECTROLYTIC PRODUCTION OF CHLORINE UTILIZING HCl DERIVED FROM A CYANOGEN CHLORIDE PROCESS

Ralph Miller, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 748,596, Dec. 8, 1976, Pat. No. 4,100,263. This application Apr. 20, 1978, Ser. No. 898,064
Int. Cl.[2] C01B *7/03*
U.S. Cl. 423—500 **1 Claim**



1. A process for preparing chlorine and manganese dioxide from manganous chloride and oxygen utilizing nitric acid and manganese dioxide as cyclic reagents, said process comprising the steps of
(1) reacting said manganous chloride with manganese dioxide and nitric acid to form an acidic solution containing manganous nitrate and gaseous chlorine, the molar ratio of manganese dioxide to manganous chloride being in excess of 1:1 and the molar ratio of nitric acid to manganous chloride being in excess of 4:1;
(2) separating and removing said gaseous chlorine;
(3) coating solid manganese dioxide particles with said manganous nitrate-containing solution and heating the coated

particles above about 180° C. to form manganese dioxide and a nitrogen dioxide-containing gaseous mixture, said heating being conducted in the absence of non-condensible gases;

(4) separating said solid manganese dioxide from said gaseous product;

(5) reacting the nitrogen dioxide-containing gas from step (4) with oxygen and water to form nitric acid;

(6) recycling said nitric acid to step (1); and

(7) withdrawing a quantity of manganese dioxide separated in step (4) equivalent to the amount of manganous chloride reacted in step (1) and recycling the remainder of said withdrawn manganese dioxide to steps (1) and (3) respectively, the amount recycled to step (3) being equal to the amount originally coated with said manganous nitrate-containing solution with the remaining portion being recycled to step (1).

4,175,117

PRODUCTION OF CERAMIC POWDERS FOR FERRITE, SPINEL, TITANATE AND GARNET PRODUCTION

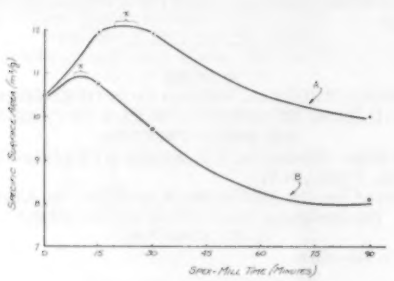
Brian Hill, Ramsey, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 501,632, Aug. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 261,798, Jun. 12, 1972, abandoned. This application Jan. 17, 1977, Ser. No. 801,727

The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.[2] B02C *19/12*

U.S. Cl. 423—594 **11 Claims**



1. A process for producing dense, composite ceramic product powder particles, the product particles being characterized by (i) an intimate interdispersion of initial constituent particles, (ii) a large internal interfacial surface within individual product powder particles with the individual constituent particles being distributed substantially uniformly at close interparticle spacings within the product powder particles, which comprises forming a charge composed of milling impacting elements and the ceramic powder particles to be milled, the ceramic powder charge particles being formulated to provide composite product powder particles which upon heating react to form a member from the group consisting of spinels, ferrites, titanates and garnets, with the weight ratio of impacting elements to powder being greater than 3:1, subjecting the charge under dry conditions to high transmissive energy milling such that the individual constituent powder particles are continuously brought into contact with the compressive energies of the milling impacting elements, and continuing the milling for a period beyond the threshold point of the powder constituents such that the constituent powder particles undergo substantial mechanical cold bonding in the solid state and such that the surface area of the composite product powder particles is less than the constituent powders with the particle size being markedly increased, whereby dense, composite, mechanically cold bonded ceramic product powder particles are produced, the composite product particles being further characterized by a high degree of homogeneity.

4,175,118

METHOD FOR MANUFACTURING A HIGH POROUS ALUMINA HAVING A LARGE SURFACE AREA AND A LOW BULK DENSITY

Martin Wassermann, Hamburg; Klaus Noweck, Brünsbuttel, and Arnold Meyer, Michaelisdonn, all of Fed. Rep. of Germany, assignors to Condea Chemie GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 746,747, Dec. 2, 1976, abandoned. This application May 23, 1978, Ser. No. 908,626

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556804

Int. Cl.[2] C01F *7/02*

U.S. Cl. 423—628 **10 Claims**

1. A process of preparing a highly porous alumina having a surface area of about 300 to 420 m^2/g, a bulk density of 0.13 to 0.3 g/ml and a pore volume of 1.1 to 2.1 ml/g and wherein at least 50% of the pore diameters are less than 1000 Å comprising hydrolyzing an aluminum alcoholate which is an aliminum alkanolate of an alkanol having 1 to 30 carbon atoms at a temperature of 40° to 90° C. in an aqueous solution containing 8 to 30% by weight of a compound which upon drying or activating the alumina formed decomposes to form NH_3 or a mixture of NH_3 and CO_2, said decomposing compound being ammonium carbonate, ammonium bicarbonate, urea, or ammonium acetate, there being used 0.5 to 3 parts by weight of said compounds per 10 parts of aluminum alcoholate, separating the aluminum oxyhydrate paste formed by the hydrolysis from the alcohol phase, and subsequently drying the alumina.

4,175,119

COMPOSITION AND METHOD TO PREVENT ACCIDENTAL AND INTENTIONAL OVERDOSAGE WITH PSYCHOACTIVE DRUGS

Garry L. Porter, 507 N. Volutsia, Wichita, Kans. 67214

Filed Jan. 11, 1978, Ser. No. 868,607

Int. Cl.[2] A61K *9/30, 31/00*

U.S. Cl. 424—10 **53 Claims**

1. A method of inducing emesis to preclude death from accidental or intentional overdosage of a therapeutic composition, which is normally of the type which if ingested by prescription is safe, but if excessively ingested is lethal, comprising the steps of:

a. coating the surface of the therapeutic composition with between about 0.25 and 2.0 mg. of an emetic chemical comprising a major proportion of methyl cephaeline and cephaeline and a minor proportion of psychotrine, O-methylpsychotrine, and emetamine;

b. controlling the quantity of said emetic chemical coated on the surface of the therapeutic composition such that no emesis ensues if normal prescription directions are followed or if no overdosage occurs;

c. ingesting excessive quantities by a being of said therapeutic composition of step (b), said excessive quantities comprising an accumulation of a total dosage of at least 21 mg. of the emetic chemical; and,

d. emesis by said being of the ingested excessive quantities of coated therapeutic composition of step (c) in order to render the therapeutic compositions harmless and preclude death or serious illness to said being.

4,175,120

DENTIFRICE

Murray L. Schole, 487 Munroe Ave., North Tarrytown, N.Y. 10591

Filed Oct. 30, 1978, Ser. No. 956,200

Int. Cl.[2] A61K *7/22, 7/24*

U.S. Cl. 424—54 **3 Claims**

1. A water-containing dentifrice consisting essentially of strontium edatate in an amount sufficient to provide from about 2.5 wt.% to about 25 wt.% of strontium ion and from about 0.1 wt.% to about 10 wt.% of a ricinoleate compound

said dentifrice being free from strontium edatate-sequestering Ca, Mg, Al, Sn metal.

4,175,121

METHIONINE HYDROXY ANALOG-CONTAINING FEED FOR LACTATING COWS

Nagaraja S. Mantha, Greenfield Park, Canada, assignor to Agrimel Ltd., Laprairie, Canada

Filed Mar. 20, 1978, Ser. No. 888,191

Int. Cl.[2] A23K *1/00*

U.S. Cl. 424—94 **9 Claims**

1. A method of improving the milk production of dairy cows, which comprises feeding to said cows as part of their feed diet a composition or complex of 2-hydroxy-4-(methylthio) butyric acid methionine hydroxy analog and a fungal enzyme derived from a microorganism of the genus *Aspergillus*, the methionine hydroxy analog being present in an amount of 5–20% by weight of the composition and being in particulate form, with the particles thereof being coated with a powder of synthetic flavoring agent which masks the taste of the methionine and fungal enzyme being present in an amount of 0.5–5% by weight of the composition and a buffer in the amount of 2–6% by weight, the composition or complex being fed in an amount to provide 20–40 g./day of the methionine hydroxy analog to each cow.

4,175,122

BIOLOGICALLY ACTIVE AMIDES

Norman R. Lazarus, Gravesend, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 676,645, Apr. 14, 1976, abandoned. This application Nov. 15, 1977, Ser. No. 851,706

Claims priority, application United Kingdom, Apr. 15, 1975, 15414/75; Mar. 31, 1976, 12945/76

Int. Cl.[2] A61K *37/02, 37/24*

U.S. Cl. 424—177 **9 Claims**

1. A method of treating a mammal for hyperinsulinaemia comprising the parenteral administration to the mammal suffering from hyperinsulinaemia of a non-toxic hyperinsulinaemia treatment effective amount of a polypeptide designated Pancreatic Hormone III or a pharmaceutically acceptable salt or metal complex of said polypeptide.

4,175,123

AMINO-SUGAR DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITION THEREOF

Bodo Junge; Hans-Peter Krause; Lutz Müller; Walter Puls, all of Wuppertal, and Jürgen Stoltefuss, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

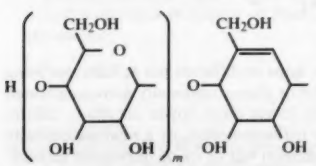
Filed Dec. 15, 1977, Ser. No. 861,043

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658562; Jun. 10, 1977, 2726207

Int. Cl.[2] A61K *31/73;* C07H *5/06*

U.S. Cl. 424—180 **10 Claims**

1. An amino-sugar derivative of the formula



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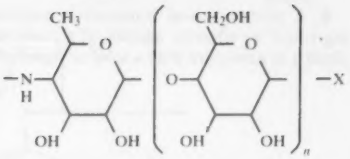


in which

n and m independently of each other represent an integer from 0 to 8 and the value of the sum n+m is an integer from 0 to 8 and

X represents a group —OR, —SH, —SR, —NH_2, —NHR or NRR_1, in which

R represents alkyl with 1 to 30 carbon atoms, alkenyl with 2 to 6 carbon atoms, cycloalkyl with 3 to 7 ring carbon atoms, aralkyl with 6 to 10 carbon atoms in the aryl part, monocyclic or bicyclic aryl with 6 to 10 carbon atoms, or heterocyclic with 5 to 6 ring members and 1 to 3 heteroatoms, said alkyl being unsubstituted or substituted by up to 5 substituents, which substituents are hydroxyl; alkoxy with 1 to 4 carbon atoms; amino or monoalkylamino or dialkylamino with 1 to 4 carbon atoms per alkyl radical; mercapto or alkylthio with 1 to 4 carbon atoms; halogen; alkylcarbonyl with 1 to 4 carbon atoms in the alkyl radical; carboxyl; nitro; cyano; the aldehyde group and the sulphonic acid group, said alkenyl being unsubstituted or substituted by hydroxyl; alkoxy with 1 to 4 carbon atoms, mercapto, alkylthio with 1 to 4 carbon atoms, halogen or nitro, said cycloalkyl being unsubstituted or substituted with the substituents defined above where R is alkyl, said aryl and aralkyl being unsubstituted or substituted by up to 3 substituents, said substituents being alkyl having 1 to 10 carbon atoms which is, in turn, unsubstituted or substituted by chlorine, nitro or cyano; alkenyl with 1 to 10 carbon atoms, which is unsubstituted or substituted by cyano; cyclohexyl; hydroxyl or alkoxy with 1 to 4 carbon atoms; amino or monoalkylamino or dialkylamino with 1 to 4 carbon atoms per alkyl radical; mercapto or alkylthio with 1 to 4 carbon atoms; carboxyl or carboalkoxy with 1 to 4 carbon atoms; the sulphonic acid group; alkylsulphonyl with 1 to 4 carbon atoms; phenylsulphonyl; aminosulphonyl or alkylaminosulphonyl or dialkylaminosulphonyl with 1 to 4 carbon atoms per alkyl group; nitro, cyano; the aldehyde group; alkylcarbonylamino with 1 to 4 carbon atoms; alkylcarbonyl with 1 to 4 carbon atoms, benzoyl; benzylcarbonyl or phenylethylcarbonyl, each of said last-mentioned alkyl, phenyl, benzyl and phenylethyl groups being unsubstituted or, in turn, substituted by chloro, nitro or hydroxyl, said heterocyclic radical being unsubstituted or substituted by hydroxyl; amino; C_1–C_4-alkyl; benzene nuclei or further 6-membered heterocyclic rings fused to them with the bonding of the heterocyclic radical R in this case effected via a carbon atom of the heterocyclic system or of the fused benzene nucleus or where the bonding of the heterocyclic radical R is effected via a –CH_2-bridge outside the ring.

R_1 represents alkyl with 1 to 6 carbon atoms or cycloalkyl with 3 to 7 ring carbon atoms, aralkyl with 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the alkyl part, or monocyclic or bicyclic aryl with 6 to 10 carbon atoms, said radicals being unsubstituted or substituted by alkoxy with 1 to 4 carbon atoms; amino; C_1–C_4-monoalkylamino and C_1–C_4-dialkylamino; nitro; halogen; cyano; hydroxyl; mercapto; C_1–C_4-thioalkyl or the carboxyl or sulphonic acid group and, where R_1 denotes phenyl, also by C_1–C_4-alkyl, R and R_1, taken together with the nitrogen atom to which they are bonded, forms a 5 to 7 ring membered heterocyclic ring which is saturated or unsaturated and contains 0 to 3 additional oxygen atoms, sulphur atoms or nitrogen atoms, a SO_2 group or an N-alkyl

group, in which the alkyl group contains 1 to 4 carbon atoms.

6. A pharmaceutical composition containing as an active ingredient an effective amount of a compound according to claim 1 in admixture with a solid or liquefied gaseous diluent.

4,175,124

METHOD OF TREATING HYPERCHOLESTEROLEMIA

Roy G. Hyldon, and John S. O'Mahony, both of Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 30, 1977, Ser. No. 866,100
Int. Cl.[2] A61K *31/70, 31/715*
U.S. Cl. 424—180 **8 Claims**

1. The method of lowering blood cholesterol which comprises orally administering to an animal an effective amount of oat gum.

2. The method of claim 1 wherein the amount of oat gum administered is from 0.01 percent to 0.1 percent of body weight per day.

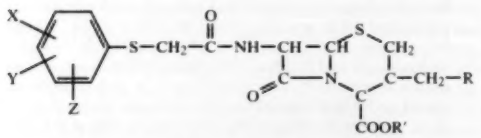
4,175,125

METHOD FOR TREATING METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS

George W. Huffman, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 807,090, Jun. 16, 1977, which is a division of Ser. No. 584,998, Jun. 9, 1975, Pat. No. 4,056,676, which is a division of Ser. No. 341,210, Mar. 14, 1973, Pat. No. 3,907,784, which is a continuation-in-part of Ser. No. 288,227, Sep. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 212,739, Dec. 27, 1971, abandoned. This application Aug. 28, 1978, Ser. No. 937,389
Int. Cl.[2] A61K *31/545*
U.S. Cl. 424—246 **2 Claims**

1. A method for treating an infection caused by methicillin resistant strains of *Staphylococcus aureus* which comprises administering to a patient having said infection a compound in an amount to combat said infection, said compound having the formula



wherein Z is hydrogen or fluorine; and, where Z is hydrogen, each of X and Y is hydrogen or chlorine selected so that the phenyl ring is substituted with 1 or 2 chlorine atoms and so that when one chlorine atom is present said chlorine atom is in the 3-position, and when two chlorine atoms are present said chlorine atoms are in the 3,4-, the 3,5- or the 2,5-positions; and,

when Z is fluorine said fluorine is in the 3- or 4-position of the phenyl ring, and each of X and Y is hydrogen or chlorine selected so that when the phenyl ring is substituted with 1 or 2 chlorine atoms, one of the chlorine atoms is in the 3- or 4-position of the phenyl ring;

R is selected from the group consisting of carbamoyloxy, methylcarbamoyloxy, and dithiocarbamoyl; and

R′ is hydrogen, dicyclohexylamine, or a pharmaceutically acceptable cation.

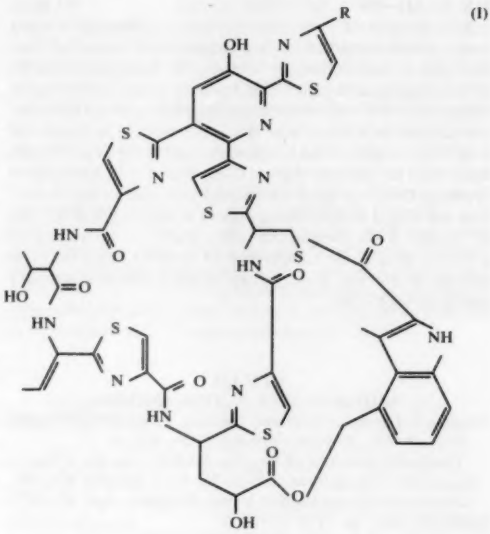
4,175,126

POLYHETEROCYCLIC-ANTIBIOTIC

Bernard Lombardi, Soisy sur Seine, and Jean Lunel, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 2, 1978, Ser. No. 930,148
Claims priority, application France, Aug. 4, 1977, 77 24011
Int. Cl.[2] A61K *31/44*; C07D *515/22*
U.S. Cl. 424—263 **10 Claims**

1. A new antibiotic, herein designated 35665 RP, of the formula:



(I)

wherein R represents the group —$CONH_2$.

7. An animal feed comprising 1 to 50 g of 35665 RP per tonne of feed.

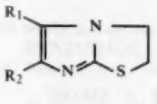
4,175,127

PYRIDYL SUBSTITUTED 2,3-DIHYDROIMIDAZO[2,1-b]THIAZOLES

Paul E. Bender, Cherry Hill, and Ivan Lantos, Blackwood, both of N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Sep. 27, 1978, Ser. No. 946,260
Int. Cl.[2] C07D *513/04*; A61K *31/44*
U.S. Cl. 424—263 **13 Claims**

1. A compound of the structure:



in which:

R_1 and R_2, being the same or different but at least one being pyridyl, are pyridyl or phenyl optionally monosubstituted by a lower alkoxy, lower alkyl, lower alkylthio, chloro, fluoro, bromo, or trifluoromethyl, or a pharmaceutically acceptable acid addition salt or oxide derivative thereof.

4,175,128

METHOD FOR TREATING CONGESTIVE HEART FAILURE

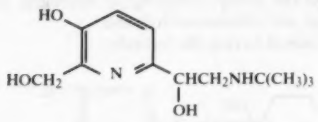
Colin R. Taylor, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 3, 1979, Ser. No. 986

Int. Cl.[2] **A61J** *3/06, 3/07, 3/10;* **A61K** *31/44*

U.S. Cl. 424—263 **7 Claims**

1. A method of treating congestive heart failure in a human subject having such condition which comprises administering orally, parenterally or by inhalation to said human subject a congestive heart failure treating amount of a compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof.

4,175,129

ANTIEMETIC 1-(BENZOXAZOLYLALKYL)-PIPERIDINE DERIVATIVES

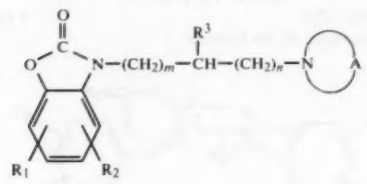
Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 687,139, May 17, 1976, Pat. No. 4,066,772, which is a continuation-in-part of Ser. No. 597,793, Jul. 21, 1975, abandoned. This application Jul. 20, 1977, Ser. No. 817,398

Int. Cl.[2] **A61K** *31/445;* **C07D** *413/06, 413/14*

U.S. Cl. 424—267 **10 Claims**

1. A chemical compound selected from the group consisting of a 1-(benzoxazolylalkyl)piperidine derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

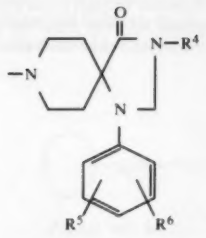
R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

R^3 is a member selected from the group consisting of hydrogen and methyl;

m and n are each an integer of from 1 to 2 inclusive; and the radical

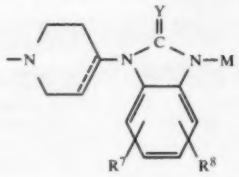
is a member selected from the group consisting of:

(a) a radical having the formula:



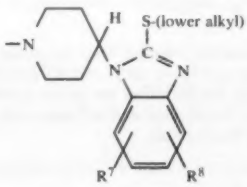
wherein R^4 is a member selected from the group consisting of hydrogen and lower alkyl; and R^5 and R^6 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

(b) a radical having the formula:



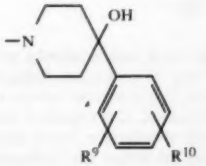
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and then said M is hydrogen;

(c) a radical having the formula:



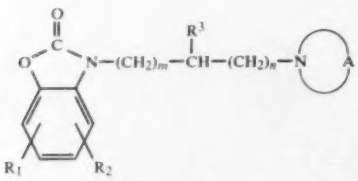
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

(d) a radical having the formula:



wherein R^9 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and R^{10} is selected from the group consisting of hydrogen and halo.

9. A method of inhibiting emesis which comprises the systemic administration in warm-blooded animals of an effective antiemetic amount of a compound selected from the group consisting of a 1-benzoxazolylalkyl)piperidine derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

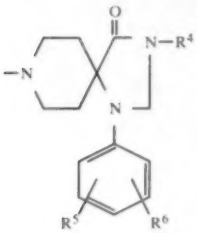
R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

R^3 is a member selected from the group consisting of hydrogen and methyl;

m and n are each an integer of from 1 to 2 inclusive; and the radical

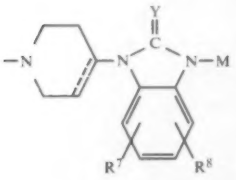
is a member selected from the group consisting of:

(a) a radical having the formula:



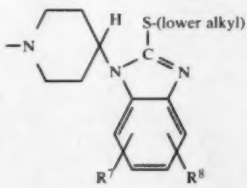
wherein R^4 is a member selected from the group consisting of hydrogen and lower alkyl; and R^5 and R^6 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

(b) a radical having the formula:



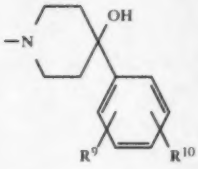
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and then said M is hydrogen;

(c) a radical having the formula:



wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

(d) a radical having the formula:



wherein R^9 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and R^{10} is selected from the group consisting of hydrogen and halo;

in admixture with a pharmaceutical carrier.

4,175,130

OXAZOLE- AND THIAZOLE-ALKANOIC ACID COMPOUNDS

Tsutomu Yamanaka; Hiroshi Yasuda, both of Oita, and Kunio Osuga, Yoshitomi, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

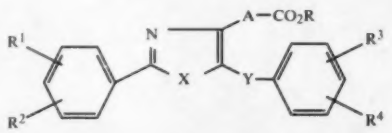
Filed Mar. 22, 1978, Ser. No. 889,073

Claims priority, application Japan, Mar. 25, 1977, 52-33469

Int. Cl.[2] **C07D** *277/20*

U.S. Cl. 424—270 **9 Claims**

1. A compound of the formula:



and pharmaceutically acceptable salts thereof, wherein:

R is a hydrogen atom or an ethyl group;

R^1 is a chlorine atom at 4-position on the phenyl nucleus;

R^2 is a hydrogen atom;

R^3 is a hydrogen atom or a methyl group;

R^4 is a hydrogen atom, a chlorine atom or a methyl group where R^3 is a hydrogen atom, or

R^4 is a methyl group where R^3 is a methyl group;

both X and Y are an oxygen atom or a sulfur atom; and

A is a methylene group.

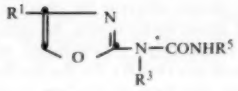
9. A pharmaceutical composition comprising the compound of claim 1 in combination with a pharmaceutically acceptable inert carrier, said compound being present in a therapeutically effective amount.

4,175,131
OXAZOLE UREAS FORMULATIONS AND ASTHMA TREATMENT

William J. Ross, Lightwater; Alex Todd, Wokingham, and John P. Verge, Henley-on-Thames, all of England, assignors to Lilly Industries Limited, London, England

Continuation of Ser. No. 678,015, Apr. 19, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,900
Claims priority, application United Kingdom, May 2, 1975, 18320/75
Int. Cl.[2] C07D *263/48*; A61K *31/42*
U.S. Cl. 424—272 7 Claims

1. An oxazole of the formula:



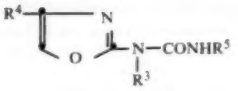
wherein:

R^1 is hydrogen, C_{1-6} alkyl, C_{1-4} hydroxyalkyl, C_{3-8} cycloalkyl, C_{3-6} alkanoyloxyalkyl, phenyl, halophenyl, trifluoromethylphenyl, methylphenyl, methoxyphenyl, or nitrophenyl;

R^3 is C_{1-6} alkyl, C_{2-6} alkenyl, C_{3-6} alkoxyalkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-4} alkyl, phenyl-C_{1-4} alkyl, halophenyl-C_{1-4} alkyl, trifluoromethylphenyl-C_{1-4} alkyl, methylphenyl-C_{1-4} alkyl, methoxyphenyl-C_{1-4} alkyl, nitrophenyl-C_{1-4} alkyl, phenyl-C_{2-4} alkenyl, halophenyl-C_{2-4} alkenyl, trifluoromethylphenyl-C_{2-4} alkenyl, methylphenyl-C_{2-4} alkenyl, methoxyphenyl-C_{2-4} alkenyl, or nitrophenyl-C_{2-4} alkenyl; and

R^5 is C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{2-4} alkenyl, phenyl, halophenyl, trifluoromethylphenyl, methylphenyl, methoxyphenyl, nitrophenyl, or C_{1-6} haloalkyl.

4. A pharmaceutical formulation useful in the treatment of asthma comprising a therapeutically effective amount for treating asthma of an oxazole of the formula:



wherein:

R^1 is hydrogen, C_{1-6} alkyl, C_{1-4} hydroxyalkyl, C_{3-8} cycloalkyl, C_{3-6} alkanoyloxyalkyl, phenyl, halophenyl, trifluoromethylphenyl, methylphenyl, methoxyphenyl, or nitrophenyl;

R^3 is C_{1-6} alkyl, C_{2-6} alkenyl, C_{3-6} alkoxyalkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-4} alkyl, phenyl-C_{1-4} alkyl, halophenyl-C_{1-4} alkyl, trifluoromethylphenyl-C_{1-4} alkyl, methylphenyl-C_{1-4} alkyl, methoxyphenyl-C_{1-4} alkyl, nitrophenyl-C_{1-4} alkyl, phenyl-C_{2-4} alkenyl, halophenyl-C_{2-4} alkenyl, trifluoromethylphenyl-C_{2-4} alkenyl, methylphenyl-C_{2-4} alkenyl, methoxyphenyl-C_{2-4} alkenyl, or nitrophenyl-C_{2-4} alkenyl; and

R^5 is C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{2-4} alkenyl, phenyl, halophenyl, trifluoromethylphenyl, methylphenyl, methoxyphenyl, nitrophenyl, or C_{1-6} haloalkyl in association with a pharmaceutically acceptable carrier therefor.

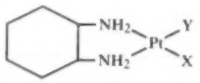
4,175,132
Patent Not Issued For This Number

4,175,133
1,2-DIAMINOCYCLOHEXANE PLATINUM (II) COMPLEXES HAVING ANTINEOPLASTIC ACTIVITY AGAINST L1210 LEUKEMIA

Glen R. Gale, and Sandra J. Meischen, both of Charleston, S.C., assignors to United States of America, Washington, D.C.

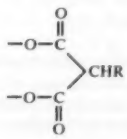
Continuation of Ser. No. 769,888, Feb. 18, 1977, abandoned, which is a division of Ser. No. 719,689, Sep. 2, 1976, Pat. No. 4,115,418. This application Nov. 29, 1977, Ser. No. 855,910
Int. Cl.[2] A61K *31/28*
U.S. Cl. 424—287 5 Claims

1. A method for the treatment of L1210 leukemia in mice which comprises administering to a mouse inflicted with L1210 leukemia an effective anti-L1210 leukemic amount of an organoplatinum complex having the formula



wherein X is a monodentate anionic ligand selected from the group consisting of $-ONO_2$ and

or together with Y a bidentate anionic ligand of the formula



wherein R is OH; when X is $-ONO_2$, Y is $-ONO_2$ or $-OH$; and when X is

Y is $-OH_2^{(+)}$.

4,175,134
PHENOXYBENZYL ESTER PESTICIDES

Royston H. Davis, and Robert J. G. Searle, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

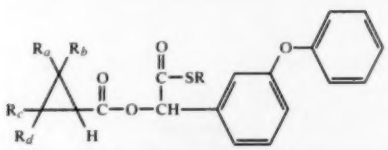
Division of Ser. No. 791,813, Apr. 28, 1977. This application Apr. 17, 1978, Ser. No. 898,367

Claims priority, application United Kingdom, Jun. 17, 1976, 25144/76

Int. Cl.[2] **A01N** *9/12;* **C07C** *153/11*

U.S. Cl. 424—301 **8 Claims**

1. An alpha-carboxylated-phenoxybenzyl ester having the formula



wherein R_a and R_b each represent an alkyl group containing from 1 to 6 carbon atoms, or a halogen atom having an atomic number from 9 to 35, inclusive; R_c and R_d each represent an alkyl group containing from 1 to 6 carbon atoms, or R_c is a hydrogen atom and R_d is an alkenyl group containing from 2 to 6 carbon atoms or a haloalkenyl group containing from 2 to 6 carbon atoms and from 1 to 3 chlorine or bromine atoms; and R represents an alkyl, alkenyl or alkynyl group each containing up to 6 carbon atoms, an aralkyl, alkaryl or aryl group each containing up to 10 carbon atoms, a hydrogen atom or a salt-forming cation selected from an alkali metal, an alkaline earth metal, ammonia or a tetraalkyl-ammonium compound in which each alkyl group contains from 1 to 10 carbon atoms.

4,175,135
METHOD OF CONTROLLING ACARINA ECTOPARASITES ON WARMBLOODED ANIMALS BY ORALLY ADMINISTERING TO THE ANIMAL AN ECTOPARASITICALLY EFFECTIVE AMOUNT OF A 2-ARYL-1,3-CYCLOHEXANEDIONE COMPOUND, AND ALKALI METAL SALTS, AMMONIUM SALTS AND ENOL ESTERS THEREOF

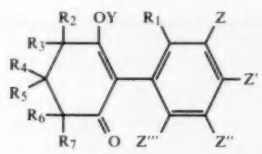
Robert G. Haines, Orange Park, Fla., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jul. 18, 1978, Ser. No. 925,814

Int. Cl.[2] **A61K** *31/22, 31/12, 31/275*

U.S. Cl. 424—311 **11 Claims**

1. A method of controlling ectoparasitic species of the order Acarina in warm-blooded animals which comprises orally administering to said animal an ectoparasitically effective amount of a compound of the formula:



wherein:

Z, Z', Z'' and Z''' are individually hydrogen, haloalkyl, halogen, alkyl, polyhaloalkyl, alkoxy, cyano, nitro, alkylthio, alkanoyl, amido, amino, alkylsulfonyl or alkylsulfinyl substituents;

Y is hydrogen or

wherein:

R is hydrogen, halogen, alkyl, alkenyl, alkynyl, bicycloalkyl, bicyloalkenyl, cycloalkyl, cycloalkenyl, phenyl, phenylalkyl, naphthyl or naphthylalkyl all of which except hydrogen and halogen may be substituted with one or more alkyl, cyano, nitro, alkoxy, halogen, haloalkyl, alkoxyalkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylsulfinylalkyl, alkylsulfonylalkyl, alkylthioalkyl or dialkylamino substituent; phenyl wherein the permissible substituents are one or more alkyl, cyano, halogen, nitro, alkoxy, alkylthio, alkylsulfinyl, -alkylsulfonyl or dialkylamino substituents; or any two, R_2, R_3, R_4, R_5, R_6, or R_7 substituents together may form an alkylene or alkenylene chain having from 2 to 20 carbon atoms completing a 3, 4, 5, 6 or 7 membered ring structure;

with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7, Z, Z', Z''' substituents individually may not include more than ten aliphatic carbon atoms and R may not include more than thirty aliphatic carbon atoms.

8. A method according to claim **1** wherein the compound is 3-(2-ethylhexanoyloxy)-5,5-dimethyl-2-(2',4'-dimethylphenyl)-2-cyclohexenone.

4,175,136
N-PHENETHYL-N-PROPYL-3,4-DIHYDROXYPHENETHYLAMINES AND SALTS THEREOF

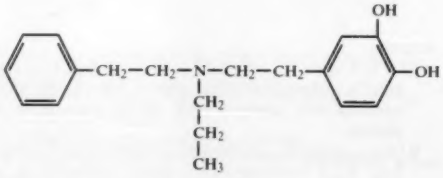
Lucien Nédélec, Le Raincy; Daniel Fréchet, Paris, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel UCLAF, Paris, France

Continuation of Ser. No. 744,514, Nov. 24, 1976, abandoned. This application May 12, 1978, Ser. No. 905,535

Int. Cl.[2] **A01N** *9/20, 9/24;* **C07C** *91/32*

U.S. Cl. 424—330 **7 Claims**

1. A compound selected from the group consisting of N-phenethyl-N-propyl-3,4-dihydroxyphenethylamine of the formula



and its non-toxic, pharmaceutically acceptable acid addition salts.

5. A method of inducing dopaminergic activity in warm-blooded animals comprising administering to warm-blooded

animals a dopaminergically effective amount of at least one compound of claim 1.

4,175,137

ETHERIFIED CYCLOALKANOLS

Saleem Farooq, Ettingen; Friedrich Karrer, Zofingen, and Georges Haas, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

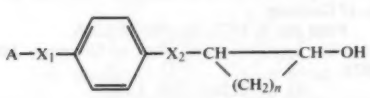
Filed Jul. 13, 1978, Ser. No. 924,315

Claims priority, application Switzerland, Jul. 20, 1977, 9002/77

Int. Cl.[2] **A01N** *9/12*

U.S. Cl. 424—337 **9 Claims**

1. A hypolipidemic pharmaceutical preparation containing an effective, the lipid content of the blood serum lowering amount of a compound of the formula I



(I)

wherein A is phenyl unsubstituted or substituted by at least one member selected from the group consisting of halogen with an atomic number up to 35 inclusive, lower alkyl, lower alkoxy and trifluoromethyl, X_1 is oxygen, sulphur or methylene, X_2 is oxygen or sulphur and n is an integer from 1 to 10 inclusive, together with a pharmaceutical carrier.

4,175,138

α-ALKYL-P-PHENOXY BENZYL ALCOHOLS, COMPOSITIONS AND TREATING LIPIDEMIA

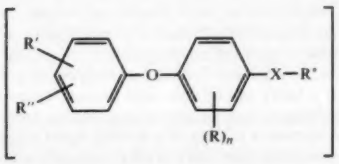
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 662,125, Feb. 27, 1976, Pat. No. 4,085,149, which is a division of Ser. No. 510,477, Sep. 30, 1974, Pat. No. 3,962,459, which is a continuation-in-part of Ser. No. 394,181, Sep. 4, 1973, abandoned. This application Jan. 30, 1978, Ser. No. 873,167

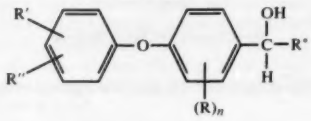
Int. Cl.[2] **A61K** *31/09*

U.S. Cl. 424—341 **7 Claims**

1. A method for treating lipidemia in mammals comprising administering to a mammal in need of such treatment an effective amount therefor of a compound of the formula:



-continued



wherein

R* is branched alkyl of 3 to 5 carbon atoms,

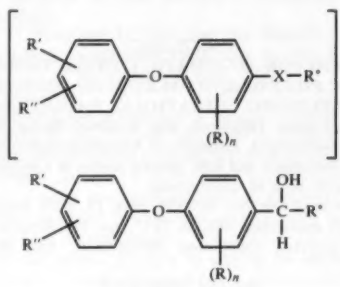
R is hydrogen, alkyl of 1 to 4 carbon atoms or halo of atomic weight of from 18 to 36,

n is 1 or 2,

R′ is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, and

R″ is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms.

5. A pharmaceutical composition in unit dosage form for treating lipidemia in mammals comprising an inert pharmaceutically acceptable carrier and from 50 to 1500 milligrams of a compound of the formula



wherein

R* is branched alkyl of 3 to 5 carbon atoms,

R is hydrogen, alkyl of 1 to 4 carbon atoms or halo of atomic weight of from 18 to 36,

n is 1 or 2,

R′is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, and

R″ is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms.

4,175,139

HYPERTENSION TREATING AGENT CONTAINING POLYPRENYL ALCOHOL

Shizumasa Kijima, Tokyo; Isao Yamatsu, Kawaguchi; Yuichi Inai, Tokyo; Toshiji Igarashi, Tokorozawa; Yoshikage Nakajima, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

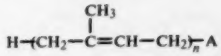
Filed Aug. 7, 1978, Ser. No. 931,687

Claims priority, application Japan, Aug. 10, 1977, 52-94965; Nov. 8, 1977, 52-133008

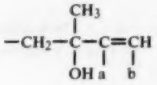
Int. Cl.[2] **A61K** *31/45*

U.S. Cl. 424—343 **15 Claims**

1. A method of treating hypertension which comprises orally or parenterally administering to a hypertensive subject requiring such treatment, a therapeutically effective amount of a hypertension treating composition comprising a pharmaceutical carrier and an effective anti-hypertensive amount of polyprenyl alcohol compound having the formula:

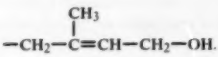


wherein n is an integer of 7–10, and A is a group of the formula:



(a)

in which a and b each is hydrogen or a and b together form a valence bond between the carbon atoms to which they are attached, or



(b)

4,175,140

METHOD FOR AUTOMATIC LOW-BACTERIA TO ASEPTIC FILLING AND PACKING OF FOODSTUFFS EMPLOYING ULTRAVIOLET RADIATION

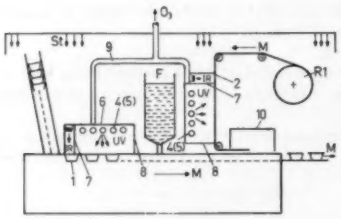
Robert Bachmann, Döttingen, and Winfried Sturm, Goldach, both of Switzerland, assignors to Aluminiumwerke AG. Rorschach, Rorschach and BBC Brown Boveri & Company Limited, Baden, both of, Switzerland

Continuation of Ser. No. 557,259, Mar. 11, 1975, abandoned. This application Jul. 26, 1977, Ser. No. 819,120

Claims priority, application Switzerland, Apr. 10, 1974, 5050/74

Int. Cl.[2] B65B *55/08*

U.S. Cl. 426—399 **12 Claims**



1. In a method for automatically packaging previously disinfected or sterilized foodstuffs under antiseptic to low-bacterial count conditions, the improvement comprising the steps of:

providing a packaging material,

producing a predetermined ultraviolet radiation of sufficient intensity to disinfect said packaging material, said step of producing including the steps of;

forming a mercury discharge with a current density of more than one ampere per square centimeter at a pressure between 0.005 and 0.5 Torr;

generating with said discharge ultraviolet radiation in which the spectral radiation intensity of the 253.7 nm line reaching said packaging material is set to at least 0.05 Watts per square centimeter; and,

destroying harmful bacteria on said packaging material exclusively by exposure of said packing material to said predetermined ultraviolet radiation for an interval of from one to sixty seconds.

4,175,141

INACTIVATION OF HEAT RESISTANT BACTERIAL PROTEASES IN ULTRA-HIGH TEMPERATURE TREATED MILK

Daniel M. Adams, Jr.; Jeff T. Barach, and Marvin L. Speck, all of Raleigh, N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Filed Feb. 25, 1977, Ser. No. 772,226

Int. Cl.[2] A23C *3/02*

U.S. Cl. 426—522 **9 Claims**

1. In the process for the ultra-high temperature treatment of milk comprising treating milk at a temperature of at least 120° C. to sterilize said milk, the improvement which comprises holding said milk at a temperature greater than 50° C. and up to 60° C. for a period of from about five to about sixty minutes immediately prior or subsequent to treating at a temperature of at least 120° C. to destroy a substantial amount of heat resistant proteases present in said milk.

4,175,142

PROCESS FOR THE PRODUCTION OF STERILIZED MAYONNAISE OR MAYONNAISE-CONTAINING PRODUCTS

Carl-Georg Hahn, Lübeck, and Kurt Rippel, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Schroeder & Co., Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 814,026

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630872

Int. Cl.[2] A23D *5/02, 5/03*

U.S. Cl. 426—605 **11 Claims**

1. A process for the production of a pasteurized or sterilized mayonnaise or mayonnaise containing product comprising

(a) mixing coagulated egg yolk, milk protein, starch, a stabilizer, a minor amount of oil and water to form a basic mixture;

(b) heating the basic mixture in a first heater in a temperature range of about 80° C. to 100° C. for a time sufficient to pasteurize said basic mixture;

(c) cooling the pasteurized mixture in a first cooler to at least room temperature;

(d) emulsifying the cooled mixture with additional oil to form an emulsion, said combined oil added in steps (a) and (d) being sufficient for preparing said product;

(e) adding with stirring ingredients comprising vinegar and spices to the emulsion to form mayonnaise or mayonnaise containing product;

(f) heating said formed product in a second heater at a temperature in the range of about 80° C. to 100° C. for a time sufficient to pasteurize said product or at a temperature in the range of about 110° C. to 130° C. for a time sufficient to sterilize said product, and

(g) cooling the pasteurized or sterilized product in a second cooler to a temperature of from about 5° to 20° C.

4,175,143

COLOR CATHODE RAY TUBE PHOSPHORS COATED BY A WETTING AGENT

Kenneth Speigel, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 2, 1979, Ser. No. 49

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—71 **7 Claims**

1. In a process for increasing the wetting capabilities of phosphors employed in color displaying cathode ray tubes, said tubes having screens formed of a multiplicity of discrete phosphor triads capable of emitting light in the primary colors, said screens having been formed by applying dry phosphor powders to a tacky photoresist, said process comprising the steps of: applying to said dry phosphor powders, before formation of said screens, a coating of a wetting agent selected from the group consisting essentially of alkyl aryl sulfonates, polyal-

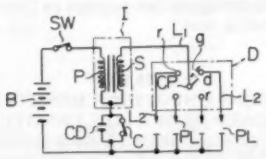
kylene glycol ether, polyethylene oxide and polyethylene glycols so that said wetting agent is non reactive with dichromatic sensitized polyvinyl alcohol within the temperature range of about 20° C. to 480° C. and vaporizable at a temperature about about 60° C. and below 480° C.; by dispensing said dry phosphor powders into a solution containing said wetting agent; mixing said phosphor and solution thoroughly; filtering said phosphor from said solution to leave a wet phosphor cake; drying said wet phosphor cake; and breaking up said dried cake.

4,175,144

METHOD FOR SURFACE TREATMENT OF ELECTRODE IN DISTRIBUTOR OF INTERNAL COMBUSTION ENGINE FOR SUPPRESSING NOISE

Osamu Hori, and Katsumi Kondo, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1977, Ser. No. 862,091
Claims priority, application Japan, Sep. 30, 1977, 52-116617
Int. Cl.[2] B05D *5/12;* **H01H** *1/02, 19/00*
U.S. Cl. 427—126 **5 Claims**



1. A method for the surface treatment of at least one electrode of both the distributor rotor and each stationary terminal in a distributor rotor of an internal combustion engine for suppressing noise, wherein finely powdered metal oxide comprising CuO and having a high electric resistance is applied onto said surface of said electrode by a coating process, wherein the improvement comprises:

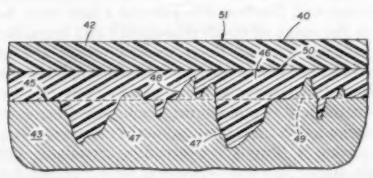
adding a finely powdered refractory and electrical insulating material to said finely powdered metal oxide comprising CuO at a predetermined mixing ratio, uniformly mixing said finely powdered metal oxide comprising CuO and said finely powdered refractory and electrical insulating material together, and then applying the mixture onto said surface of said electrode by using a spray coating process.

4,175,145

MAKING MEMORY STRUCTURE FOR LASER RECORDING SYSTEM

Henry G. Fechter, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Division of Ser. No. 770,244, Feb. 18, 1977, abandoned, which is a continuation of Ser. No. 572,482, Apr. 28, 1975, abandoned.
This application Jun. 19, 1978, Ser. No. 917,128
Int. Cl.[2] B05D *1/38, 5/00*
U.S. Cl. 427—240 **1 Claim**



1. A method of producing a thermoplastic memory structure comprising:

cleaning a substrate;

spinning the substrate;

depositing a liquid thermosetting polyurethane polymer at the center of the spinning substrate and spinning the substrate at an increased rate whereby to spread and to effect a smooth surfaced nonconformal layer of said polymer;

spinning the coated substrate at a reduced rate during which said layer is dried;

curing said nonconformal layer;

spinning said cured-layered substrate;

depositing a liquid thermoplastic polyurethane polymer at the center of the spinning cured-layered substrate and increasing the rate of spin whereby to spread the thermoplastic polymer and effect a microscopically smooth conformal layer;

spinning the now plural coated substrate at a reduced rate during which said conformal layer is dried; and

curing said conformal layer.

4,175,146

METHOD FOR IMPROVING THE PROPERTIES OF NATURAL PRODUCTS COMPOSED MAINLY OF CALCIUM CARBONATE

Tateo Ito, Kamakura, and Tomijiro Kaneko, Tokyo, both of Japan, assignors to Obata Industry & Commerce Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,665
Claims priority, application Japan, Oct. 6, 1977, 52-119509
Int. Cl.[2] B05D *3/00, 3/10*
U.S. Cl. 427—304 **7 Claims**

1. A method for reinforcing a natural product which is characterized in that calcium carbonate constitutes the main component of said natural product, which comprises the steps of: (1) soaking said natural product in a pretreatment solution containing a major amount of tin chloride and also containing hydrochloric acid and hydrofluoric acid whereby to make the surface of said natural product hydrophilic, to activate the surface of said natural product by making the surface of said natural product electrically conductive and to make stannous ions present thereon; (2) then soaking said natural product obtained in step (1) in a solution containing a major amount of palladium chloride and also containing hydrochloric acid whereby to replace said stannous ions on the surface of said natural product by palladium ions; (3) then soaking said natural product obtained in step (2) in a fluoride solution having a pH of from 4.3 to 9.0 to harden its surface; and (4) then soaking said natural product obtained in step (3) in a solution of a silane compound and a nonionic surface active agent to confer on said natural product improved resistance against acids, alkalis and salts.

4,175,147

METHOD TO REDUCE DEPOSITS OF TEREPHTHALIC ACID ON COOLING ROLLS DURING SHEET EXTRUSION OF AMORPHOUS POLYETHYLENE TEREPHTHALATE

Philip S. Bollen, Auburn, and Alfieri Degrassi, Pottsville, both of Pa., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 5, 1976, Ser. No. 729,739
Int. Cl.[2] C09D *5/16;* **C08G** *39/10*
U.S. Cl. 428—35 **16 Claims**

1. A sheet suitable to be formed and filled with heated foods and being formed from a uniform blend of from about 97.5 to 99.9% by weight of polyethylene terephthalate having an intrinsic viscosity of above about 0.9 and a melt viscosity at 525° F. of above about 10,000 poises and correspondingly from about 2.5 to 0.1% by weight of a polycarbonate resin having an intrinsic viscosity of about 0.4 to 0.6 and a melt viscosity at 500° F. of less than 50,000 poises; said sheet having a haze value as determined by ASTM D-1003 of less than about 2% and being essentially amorphous and non-oriented, so that when said sheet is extruded and rapidly cooled by contact with

a cooling surface, deposits onto said cooling surface are reduced.

4,175,148

PRODUCT CONTAINING HIGH DENSITY SKINS ON A LOW DENSITY CORE AND METHOD OF MANUFACTURING SAME

Allan J. Luck, Harvard; John T. Clarke, St. Charles, and Michael R. Hoffman, Elgin, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 739,184, Nov. 5, 1976. This application Feb. 27, 1978, Ser. No. 881,184

The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.[2] B32B *5/14*; B29J *5/04*

U.S. Cl. 428—171 **21 Claims**

1. A fiberboard product comprising a base layer comprising cellulosic fibers, said base layer having a density in the range of 10–35 pounds/ft^3; and an integral skin disposed on at least one face of said base layer, said skin having a higher density than that of the base layer and formed by contacting the surface fibers of said fiberboard with a skin forming chemical in an amount of 5–20% based on the dry weight of fibers contacted therewith, and heating said contacted surface fibers, under pressure, at a temperature of at least 525° F., said skin formed during said hot-pressing on the surface of said fiberboard contacted with said skin forming chemical.

2. A method of manufacturing a cellulosic fiber containing board having a skin on at least one surface thereof comprising:

compressing a fibrous composition, including cellulosic fibers, under heat and pressure to form a consolidated mat having a density of less than 35 pounds per cubic foot;

including a skin forming chemical in at least a surface layer of fibers of said mat in an amount in the range of 5–20% based on the dry weight of said surface layers wherein said skin forming chemical is selected from the group consisting of ammonium thiocyanate, thiourea, acetamide, dicyandiamide, ethanolamine, hexamethylenetetramine, hydrazine+formaldehyde, ammonium xylene sulfonate, mono-ammonium phosphate, di-ammonium phosphate, ammonium sulfate, sucrose, boric acid+borax, linseed oil+iron tallate, a sugar containing hemicellulose extract derived from steam digestion of wood chips, and mixtures thereof; and

hot-pressing said consolidated mat containing said skin forming chemical in at least its surface fibers, at a temperature of at least 525° F. to form a board having a skin on at least one surface thereof, said skin defined by a layer of material on said surface of said board having a density greater than the material on which the skin is formed, said skin formed during said hot-pressing on the surface of said mat containing said skin forming chemical.

4,175,149

MINERAL WOOL PRODUCT CONTAINING HIGH DENSITY SKINS AND METHOD OF MANUFACTURING SAME

Allan J. Luck, Harvard; John T. Clarke, St. Charles, and Michael R. Hoffman, Elgin, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 739,184, Nov. 5, 1976. This application Feb. 27, 1978, Ser. No. 881,551

The portion of the term of this patent subsequent to Nov. 20, 1979, has been disclaimed.

Int. Cl.[2] B32B *5/14*; B29J *5/04*

U.S. Cl. 428—171 **39 Claims**

1. A mineral wool-containing fiberboard product comprising a base layer including mineral wool fibers and a binder selected from the group consisting of cellulosic fiber, starch, and mixtures thereof, and an integral skin disposed on at least one surface of said base layer, said skin having a density in the range of 40–55 pounds/ft^3 and formed by including said binder in a surface layer in an amount effective to form said skin and contacting said cellulosic fibers or starch in said surface layer with urea in an amount of 5–20% based on the dry weight of said surface layer contacted therewith, and, after consolidation of said base layer, heating said contacted surface layer, under pressure above ambient, at a temperature of at least 525° F., said skin formed during said hot-pressing on the surface layer contacted with urea.

2. A method of manufacturing a mineral wool board having a skin on at least one surface thereof comprising:

consolidating a fibrous mat containing mineral wool fibers and a binder selected from the group consisting of cellulosic fiber, starch, and mixtures thereof to form a consolidated mineral wool board said cellulosic fiber or starch included in the surface of said consolidated board in an amount effective to form a skin on said surface;

including urea in at least a surface layer of said board in an amount of at least 5% based on the dry weight of said surface layer; and

hot-pressing said consolidated board containing urea in at least its surface fibers, at a temperature of at least 525° F. to form a mineral wool containing board having a skin on at least one surface thereof, said skin defined by a layer of material on said surface of said board having a density greater than the material on which the skin is formed, said skin formed during said hot-pressing on the surface of said board including urea.

4,175,150

UREA CONTAINING HIGH DENSITY SKIN FIBERBOARD WITH A LOW DENSITY CORE

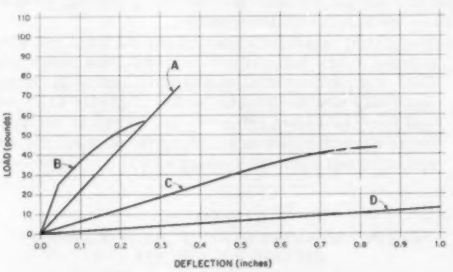
Allan J. Luck, Marengo; John T. Clarke, and Michael R. Hoffman, both of St. Charles, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Nov. 5, 1976, Ser. No. 739,184

The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.[2] B32B *5/14, 7/02*; B29J *5/04*

U.S. Cl. 428—171 **35 Claims**



1. A fiberboard product comprising a base layer comprising cellulosic fibers and a binder, said base layer having a density in the range of 10–35 pounds/ft^3; and an integral skin disposed on at least one face of said base layer, said skin having a density in the range of 40–55 pounds/ft^3 and formed by including urea within the surface fibers of said fiberboard, in an amount of 5–20% based on the dry weight of fibers containing urea, consolidating said fiberboard to provide a base layer having a density in the range of 10–35 pounds/ft^3, and thereafter heating said contacted surface fibers, under pressure, at a temperature of at least 525° F., to form said skin during hot-pressing on the surface of said mat containing urea.

2. A method of manufacturing cellulosic fiber containing board having a skin on at least one surface thereof comprising:

compressing a fibrous composition, containing cellulosic fibers, under heat and pressure to form a consolidated mat having a density of less than 35 pounds per cubic foot;

including urea in at least a surface layer of fibers of said mat in an amount in the range of 5–20% based on the dry weight of said surface layer; and

hot-pressing said consolidated mat containing urea in at least its surface fibers, at a temperature of at least 525° F. to form a board having a skin on at least one surface thereof, said skin defined by a layer of material on said surface of said board having a density greater than the material on which the skin is formed, said skin formed during said hot-pressing of said mat including urea.

4,175,151

PROCESS FOR THE PRODUCTION OF DECAL TRANSFERS AND DECAL TRANSFERS PRODUCED ACCORDING TO THE PROCESS

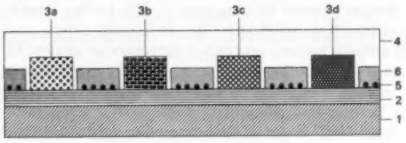
Alfred Eppich, Zirndorf, and Rudolf H. Hochleitner, Weiherhof, both of Fed. Rep. of Germany, assignors to Firma F. Xaver Leipold, Nuremberg, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,918

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729288

Int. Cl.[2] B32B *7/06;* **B41M** *3/12*

U.S. Cl. 428—202 **7 Claims**



2. A decal transfer consisting of

a solvent-permeable backing,

a solvent-soluble separation layer on said backing,

a printed color picture on said separation layer,

a solvent-soluble cover on said separation layer in at least the picture-free areas, and

an insoluble protective-transfer foil covering said picture and the majority of said cover.

4,175,152

POLYMERIC MATERIALS CONTAINING SEMICONDUCTING REFRACTORY OXIDES

Robert D. Carnahan, Barrington, Ill.; William C. Holt, Jr., Alexandria, Va., and Karl J. Youtsey, Decatur, Ala., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 670,014, Mar. 24, 1976, Pat. No. 4,107,092, which is a continuation-in-part of Ser. No. 335,972, Feb. 26, 1973, abandoned. This application Mar. 17, 1978, Ser. No. 887,688

Int. Cl.[2] H01B *1/06*

U.S. Cl. 428—242 **7 Claims**

1. An electrically conductive sheet which comprises at least one layer of a reinforcing material provided with a polymeric matrix material containing from about 10% to about 95% by weight of a finely divided semiconductive filler comprising a refractory inorganic oxide having a carbonaceous pyropolymer composited on the surface thereof, said semiconductive filler having a particle size of from about 0.1 to about 100 microns and a resistivity in the range of from about 0.001 ohm-centimeter to about 10^{10} ohm-centimeter.

4,175,153

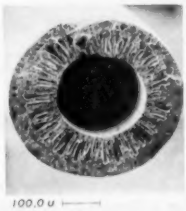
INORGANIC ANISOTROPIC HOLLOW FIBERS

Emerick J. Dobo, Cary, and Tommy E. Graham, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed May 16, 1978, Ser. No. 906,502

Int. Cl.[2] D02G *3/00*

U.S. Cl. 428—398 **42 Claims**



1. An essentially inorganic, sintered monolithic hollow fiber having a radially anisotropic internal void volume wall structure.

4,175,154

SHEET BACKING FOR DECORATIVE COVERING MATERIAL

Kenneth J. Faust, Cressona, and Douglas C. Woerner, Northampton, both of Pa., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,431

Int. Cl.[2] B32B *3/26, 5/20;* **B05D** *5/00, 3/02*

U.S. Cl. 428—313 **5 Claims**

1. Decorative, flexible, sheet type covering material having a substrate comprising a porous non-woven mat of glass fibers saturated and completely coated on both sides with foamed, heat cured, polyvinyl chloride plastisol or organosol, said mat being characterized by:

a. the glass fibers having an average diameter between about 7 and about 15 microns and an average length between about 0.2 and about 1.5 inch;

b. openings in such mat averaging between about 1 and about 20 mils in the smallest linear dimension with at least about 50 percent of such openings having smallest linear dimensions between about 2 and about 10 mils; and

c. the mat being between about 10 and about 40 mils thick and having a density between about 1 and about 4 pounds per 100 square feet.

4,175,155

DECORATIVE COVERING MATERIAL

Jerome Biranowski, Bronx, N.Y., and Kenneth J. Faust, Cressona, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,432

Int. Cl.[2] B32B *3/26, 5/20;* **B05D** *5/00, 3/02*

U.S. Cl. 428—313 **4 Claims**

1. Decorative, flexible, sheet type covering material having a substrate comprising a porous, non-woven mat of glass fibers saturated and completely coated on both sides with foamed, heat cured, flexible urethane, said mat being characterized by;

a. the glass fibers having an average diameter between about 7 and about 15 microns and an average length between about 0.2 and about 1.5 inch;

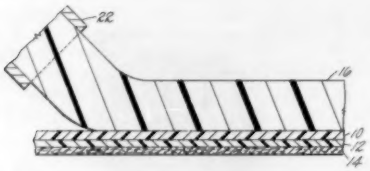
b. openings in such mat averaging between about 1 and about 20 mils in the smallest linear dimension with at least about 50 percent of such openings having smallest linear dimensions between about 2 and about 10 mils; and

c. the mat being between about 10 and about 40 mils thick and having a density between about 1 and about 4 lbs per 100 square feet.

4,175,156
COMPOSITE FILM ADHESIVE

Thomas G. Ikins, Battle Creek, Mich., assignor to USM Corporation, Farmington, Conn.

Filed May 19, 1978, Ser. No. 907,663
Int. Cl.[2] B32B *27/40, 27/36, 27/30*
U.S. Cl. 428—336 **14 Claims**

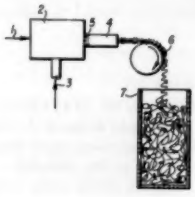


1. Composite film adhesive comprising a layer of heat activatable adhesive for adhesion to a plasticized resin which adhesive is resistant to plasticizer migrating from said resin and a layer of tough flexible resin for adhesion to a urethane adhesive layer and in strongly adhesive intimate relation to said heat activatable adhesive layer, said tough flexible resin containing at least 10^{-4} mol of active hydrogen per gram of tough flexible resin for reaction with free NCO groups of a urethan adhesive.

4,175,157
PROCESS FOR TEXTURIZING POLYESTER YARN AND YARN

Rene Guillermin, Bron; Jean Joly, Craponne, and Silvio Sangalli, Caluire, all of France, assignors to Rhone-Poulenc Textile, Paris, France

Continuation of Ser. No. 724,848, Sep. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 557,088, Mar. 10, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,615
Claims priority, application France, Mar. 22, 1974, 74 10429
Int. Cl.[2] D02G *1/12, 1/16, 1/20*
U.S. Cl. 428—369 **13 Claims**



1. A process for the preparation of texturized multifilament polyester yarn possessing a stable crimp, by crimping and compressing the said yarn, in which the yarn passes first through an injector where it is subjected to a stream of hot fluid which separates the filaments, and thereafter through a stacking nozzle to cause crimping, wherein the fluid is fed into the injector at a temperature below the second order transition temperature of said polyester yarn, the stack, after it issues from the nozzle is kept in the compressed state, subjected in this state to a high pressure of the order of 20 to 200 kg/cm^2, and kept at a temperature below the second order transition temperature of said polyester yarn for a period of time ranging from one minute to 150 minutes.

4,175,158
AGGLOMERATING PARTICULATE PERLITE

Elerington Saunders, 2835 E. Van Buren St., Phoenix, Ariz. 85009

Filed Oct. 17, 1977, Ser. No. 842,888
Int. Cl.[2] B32B *9/00;* **C04B** *31/22*
U.S. Cl. 428—402 **14 Claims**

1. A method of forming a particulate product consisting essentially of agglomerated particulate perlite fines, said method comprising the steps of:

(a) commingling said perlite fines with a boron compound to form a particulate mixture with said boron compound, said boron compound capable of being substantially converted to B_2O_3 at elevated temperatures;

(b) initially heating said particulate mixture sufficiently to coat said perlite fines at least partially with said boron compound while continuously mixing said particulate mixture;

(c) converting said boron compound to B_2O_3; and

(d) diffusing said B_2O_3 into said perlite by additional heating of said particulate mixture; said steps resulting in the formation of a plurality of particles, said particles being larger than said perlite fines.

9. A method of forming a particulate filter aid by agglomerating particulate perlite fines having an initial mean particle size of less than 30 microns comprising the steps of:

(a) commingling said perlite fines with particulate solid H_3BO_3 to form a particulate mixture of approximately 5 weight percent H_3BO_3, said H_3BO_3 having a particle size of less than −325 U.S. Standard mesh;

(b) initially heating said particulate mixture above 365° F. for at least one minute while mixing said particulate mixture; and

(c) heating said particulate mixture to a temperature of at least 1200° F. for at least one hour, said steps resulting in the formation of a plurality of particles, said particles being larger than said perlite fines.

13. A particulate agglomerate consisting essentially of perlite particles, said agglomerate being formed from fine particulate perlite and produced by initially coating said fine particulate perlite with molten H_3BO_3 while mixing said perlite and said H_3BO_3 to form a particulate mixture, subsequently converting said H_3BO_3 to B_2O_3 by heat treatment; and finally, diffusing said B_2O_3 into said perlite by heating said particulate mixture to a temperature of at least 1200° F.

4,175,159
SILICONE EMULSIONS FOR TREATING SILICATE PARTICULATE MATTER

William J. Raleigh, Rensselaer, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,461
Int. Cl.[2] B32B *17/00;* **C08A** *31/09*
U.S. Cl. 428—405 **21 Claims**

1. A silicone emulsion for treating silicate particulate matter selected from perlite and vermiculite to make the particulate matter water-resistant comprising (a) from 40 to 60 parts by weight of a silicone fluid having R_2SiO units. R $SiO_{1.5}$ units and R $SiO_{0.5}$ units where the ratio of organosiloxy units to diorganosiloxy units varies from 0.11 to 1.4 inclusive and the ratio of triorganosiloxy units to diorganosiloxy units varies from 0.02 to about 1 inclusive and the fluid has a silanol content varying from 0.1 to 8 percent by weight and a viscosity varying from 10 to 10,000 centipoise at 25° C. and where R is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms vinyl radicals and mononuclear aryl radicals; (b) from 0.5 to 5 parts by weight of an aliphatic carboxylic acid having from 6 to 20 carbon atoms; (c) from 0.1 to 0.8 parts by weight of ammonia and (d) from 20 to 150 parts of water.

16. A method for coating silicate matter selected from perlite and vermiculite so as to render it water-resistant comprising (1) applying to the surface of the silicate particulate matter a silicone emulsion having (a) from 40 to 60 parts by weight of a

silicone fluid having R_2SiO units, R $SiO_{1.5}$ units and $R_3SiO_{0.5}$ units where the ratio of organosiloxy units to diorganosiloxy units varies from 0.11 to 1.4, inclusive, and the ratio of triorganosiloxy units to diorganosiloxy units varies from 0.02 to about 1, inclusive, and the fluid has a silanol content varying from 0.1 to 8 percent by weight and a viscosity varying from 10 to 10,000 centipoise at 25° C. and where R is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms, vinyl radicals, and mononuclear aryl radicals; (b) from 0.5 to 5 parts by weight of an aliphatic carboxylic acid having from 6 to 20 carbon atoms; (c) from 0.1 to 0.8 parts by weight of ammonia; and (d) from 20 to 150 parts of water; and (2) curing the silicone emulsion and evaporating the water.

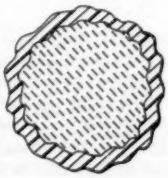
21. A method for coating silicate particulate matter selected from perlite and vermiculite so as to render it water-resistant comprising (1) applying to the surface of the silicate particulate matter a silicone emulsion having (a) from 40 to 60 parts by weight of a linear silanol terminated diorganopolysiloxane polymer having a viscosity varying from 10 to 10,000 centipoise at 25° C. where the organo group is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms and mononuclear aryl radicals; (b) from 0.5 to 5 parts by weight of an aliphatic carboxylic acid having from 6 to 20 carbon atoms; (c) from 0.1 to 0.8 parts by weight of ammonia; and (d) from 20 to 150 parts of water; and (2) curing the silicone emulsion and evaporating the water.

4,175,160

COATED PHOSPHORS AND ARTICLES EMPLOYING SAME

Clarence D. Vanderpool, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 22, 1978, Ser. No. 917,825
Int. Cl.[2] B32B *5/16, 9/00*
U.S. Cl. 428—407 **10 Claims**



1. A composite article of manufacture comprising a phosphor particle and a coating on the surface of the particle, the coating comprising polyvinyl alcohol modified with at least one amino acid in the amount of about 30 to 80 weight percent of the coating.

4,175,161

METHOD OF IMPROVING THE ADHESION OF A HEAT ACTIVATABLE POLYURETHANE ADHESIVE TO A VINYL SUBSTRATE

Ozzie Fogle, and James Cooley, both of Orangeburg, S.C., assignors to Champion International Corporation, Stamford, Conn.

Filed Apr. 27, 1978, Ser. No. 901,014
Int. Cl.[2] B32B *27/40, 27/30, 27/18*
U.S. Cl. 428—425 **10 Claims**

1. A method of improving the adhesion of a heat activatable polyurethane adhesive to a vinyl substrate comprising admixing said heat activatable polyurethane adhesive with at least one agent selected from the groups consisting of N-substituted-2-pyrrolidone and ethoxylated alkyl phenol, wherein said N-substituted-2-pyrrolidone substituent is lower alkyl or lower alkenyl, applying said admixture to a vinyl substrate, and thereafter reacting an organic isocyanate with the additive in said heat activatable polyurethane adhesive.

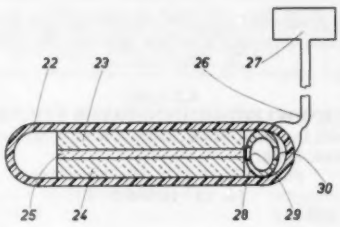
10. A laminate produced by the method of claim **1**.

4,175,162

METHOD OF MANUFACTURING A LAMINATED, LIGHT TRANSMITTING, FIRE SCREENING PANEL

Marcel De Boel, Chatelineau; Pol Baudin, Fontaine l'Eveque; Michel Wasterlain, Trazegnies, and Pierre Collignon, Marcinelle, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Nov. 28, 1977, Ser. No. 855,453
Claims priority, application United Kingdom, Nov. 30, 1976, 49850/76
Int. Cl.[2] B32B *17/06*
U.S. Cl. 428—428 **19 Claims**



1. A method of manufacturing a laminated, light-transmitting fire-screening panel comprising at least one solid layer of intumescent material sandwiched between two structural plies without the use of a sheet of plastic material to effect the bonding, comprising the steps of forming a stratum from an intumescent sodium silicate material, assembling said stratum and a first structural ply to an inorganic face of a pane comprising a second structural ply so that said stratum is in contact with said inorganic face and sandwiched between said structural plies, enveloping at least the edges of the sandwich assembly in such manner as to define a space around the edges in which sub-atmospheric pressure can be created for subjecting the inter-ply space to suction at the edges, and subjecting the sandwich assembly to a treatment in which at least one of the main external faces of the sandwich assembly is exposed to sub-atmospheric environmental pressure while the sandwich assembly is exposed to heat in a treatment chamber and the inter-ply space is subjected to the aforesaid suction to effect bonding of the various plies without causing the intumescent material to become tumid, the environmental temperature during said treatment being at least 50° C. and not more than 95° C., the sandwich assembly being subjected to a supplementary bonding stage following said treatment in which final bonding takes place at above atmospheric pressure in excess of 10 kg/cm^2.

4,175,163

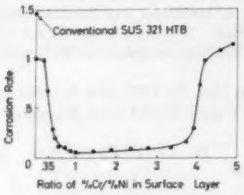
STAINLESS STEEL PRODUCTS, SUCH AS SHEETS AND PIPES, HAVING A SURFACE LAYER WITH AN EXCELLENT CORROSION RESISTANCE AND PRODUCTION METHODS THEREFOR

Teruo Ikeno, Mitaka; Satoshi Kado, Fujisawa; Yasuo Otoguro, Machida; Yasuhiko Miyoshi, Tokyo; Chuichi Kato, and Tadao Azami, both of Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 24, 1977, Ser. No. 780,781
Claims priority, application Japan, Mar. 29, 1976, 51-33498; Apr. 7, 1976, 51-38929; May 12, 1976, 51-53939
Int. Cl.[2] C09D *5/08*
U.S. Cl. 428—553 **2 Claims**

1. A stainless steel product with an excellent high temperature corrosion resistance against vanadium pentoxide and sodium sulfate, having a surface layer of 10μ to 2 mm in thickness, composed mainly of Cr and Ni within a range of $0.35 \leqq \%Cr/\%Ni \leqq 4.0$ containing one or more elements selected from the group consisting of Al, Zn, Sn, Cu, Pb, Si and B in a total amount of not more than 1.0%, and having a poros-

ity of not more than 4.0%, and a diffusion layer of at least 1μ in thickness formed by diffusion of at least one element selected



from the group consisting of Cr and Ni into the base metal at the interface between the surface layer and the base metal.

4,175,164

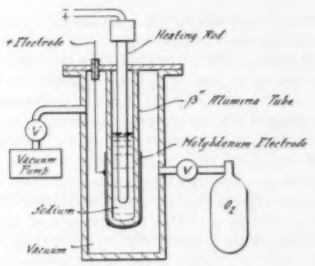
THERMOELECTRIC GENERATOR ELECTRODE

Terry Cole, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 10, 1978, Ser. No. 894,969

Int. Cl.[2] H01M *10/36*

U.S. Cl. 429—11 **19 Claims**



1. An alkali metal thermoelectric generator device that has an electrically continuous, porous electrode on solid electrolyte that comprises metal peaks averaging below about 50 micrometers and valleys below about 10 micrometers and having an average pore diameter above about 0.15 microns.

4,175,165

FUEL CELL SYSTEM UTILIZING ION EXCHANGE MEMBRANES AND BIPOLAR PLATES

Otto J. Adlhart, Newark, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Jul. 20, 1977, Ser. No. 817,455

Int. Cl.[2] H01M *8/04*

U.S. Cl. 429—30 **32 Claims**

1. A fuel cell assembly comprising a plurality of fuel cell laminates stacked together in substantially parallel relationship to each other, each fuel cell laminate comprising a catalytic fuel electrode to which a fuel is fed;

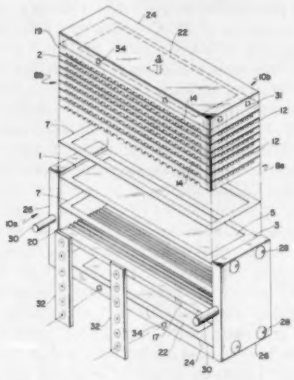
a catalytic oxygen electrode to which an oxygen-containing gas is fed;

an ion exchange membrane as an electrolyte member between and in contact with the fuel and oxygen electrodes;

a plurality of electrically conductive bipolar plates separating adjacent fuel cell laminates in the stack, each of said bipolar plates having opposite surfaces contacting electrodes of the cells in the stack, one surface contacting a fuel electrode and the opposite surface contacting an oxygen electrode;

means for supplying fuel to said electrodes comprising a plurality of separate fuel gas flow channels on a surface of each bipolar plate contacting a fuel electrode, said means for supplying fuel extending from one edge of a bipolar plate to the opposite edge of the plate; and

means for supplying an oxygen-containing gas to each oxygen electrode, comprising a plurality of separate oxygen-containing gas flow channels on the surface of each bipolar plate in contact with the oxygen containing electrode, said oxygen-containing gas supply means extending from



one edge of each bipolar plate to said opposite edge, the oxygen gas flow channel generally having a larger cross sectional area compared with fuel gas flow channels while arranged along parallel planes in perpendicular pathways.

4,175,166

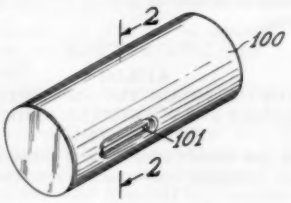
SEALED CONTAINER CONSTRUCTION CAPABLE OF SAFELY VENTING INTERNAL PRESSURE

Martin G. Rosansky, Mt. Vernon, N.Y., assignor to Power Conversion, Inc., Mount Vernon, N.Y.

Filed May 2, 1978, Ser. No. 902,031

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—56 **5 Claims**



1. A sealed electrical energy storage container being cylindrical in shape and having an internal cylindrical radius, r, said container being arranged to safely vent its contents at a predetermined internal pressure, P, and said container comprised of a material having an ultimate tensile strength, S, characterized by, said container sidewalls being of generally uniform thickness and having at least one area of reduced thickness, t, wherein $t = Pr/S$, whereby said area of reduced thickness ruptures at pressure P to safely vent the storage container contents.

4,175,167
ELECTRODE HAVING POLYTETRAFLUOROETHYLENE POWDER DISPERSED ON ITS OUTER SURFACE

Johannes A. van Lier, Cleveland, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

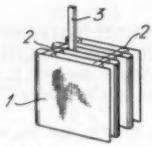
Filed Mar. 31, 1978, Ser. No. 892,312
Int. Cl.[2] H01M *10/52*
U.S. Cl. 429—59 **6 Claims**

1. A coherent powder electrode having disposed upon and confined only to its outer surface polytetrafluoroethylene particles in an amount of less than 0.5 percent by weight of the active material in the electrode and wherein the polytetrafluoroethylene particles on the outer surface of the electrode cover no more than about 65 percent of the visible surface area of the electrode.

4,175,168
ZINC ELECTRODE FOR LOW TEMPERATURE

William A. Armstrong, and Peter J. Powell, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Canada

Filed Oct. 4, 1978, Ser. No. 948,524
Claims priority, application Canada, Oct. 12, 1977, 288578
Int. Cl.[2] H01M *4/42*
U.S. Cl. 429—229 **17 Claims**

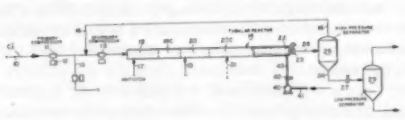


1. An electrode for use in an electrochemical cell comprising a strip of a perforated electrochemically active metal material, said strip being folded upon itself to form sections, and a plurality of spacers attached between and separating adjacent sections, said spacer being made of a perforated electrochemically active material and being of sufficient thickness to permit adequate electrolyte flow between adjacent sections.

4,175,169
PRODUCTION OF POLYETHYLENE

Charles D. Beals; George I. Fitzpatrick, and Kim L. O'Hara, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 625,415, Oct. 24, 1975, abandoned, which is a continuation of Ser. No. 386,915, Aug. 9, 1973, abandoned, which is a continuation of Ser. No. 126,300, Mar. 19, 1971, abandoned, which is a division of Ser. No. 37,610, May 15, 1970, Pat. No. 3,628,918. This application Jan. 16, 1978, Ser. No. 869,727
Int. Cl.[2] C08F *2/02, 4/28, 10/02*
U.S. Cl. 526—64 **21 Claims**



1. In a process for producing polyethylene in a tubular reactor having an inlet and an outlet and at least one reaction zone having an internal diameter between 0.5 and 3 inches, at a temperature within the range between about 300° F. and about 650° F. and at a pressure between about 1,000 and 3,500 atmospheres and in the presence of a free radical yielding initiator, the improvement which comprises:

passing the reaction mass through each reaction zone in said tubular reactor at a bulk fluid velocity sufficient so that the Flow Number is greater than 3.3 $ft.^2/sec.$ and wherein the total pressure drop within said tubular reactor is controlled to be less than 6,000 psi.

4,175,170
MANUFACTURE OF OLEFIN POLYMERS

Guenther Schweier, Ludwigshafen; Robert Bachl, Worms; Heinz Mueller-Tamm, Ludwigshafen; Hans Frielingsdorf, Bad Durkheim; Wolfgang Gruber, Frankenthal, and Erich Kolk, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 7, 1976, Ser. No. 720,777
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1975, 2543181
Int. Cl.[2] C08F *4/02, 10/02*
U.S. Cl. 526—125 **8 Claims**

1. A process for the manufacture of a homopolymer or copolymer of an α-monoolefin of 2 to 10 carbon atoms by polymerizing the monomer or monomers at a temperature of from 30° to 200° C. and a pressure of from 0.1 to 200 bars, by means of a Ziegler catalyst system comprising (1) a catalyst component containing titanium and/or vanadium and (2) a metal compound of the general formula

$$MeA_{m-n}X_n$$

where Me is aluminum, magnesium or zinc, A is a hydrocarbon radical of 1 to 12 carbon atoms, X is chlorine, bromine, iodine or hydrogen m is the valency of the metal Me and n is a number from 0 to m−1, the atomic ratio of transition metal in catalyst component (1) to metal (Me) in catalyst component (2) being from 1:0.1 to 1:500, wherein the catalyst component (1), containing titanium and/or vanadium, is the solid-phase product (VII) which has been obtained by first

(1.1) bringing a finely divided porous inorganic oxidic material (I), which has a particle diameter of from 1 to 1,000μ, a pore volume of from 0.3 to 3 cm^3/g, and a surface area of from 100 to 1,000 m^2/g, and which has the formula SiO_2, into contact with an aluminum compound (II) dissolved in an organic solvent and having the general formula

$$AlB_{3-p}Y_p$$

where B is hydrocarbon radical of 1 to 12 carbon atoms, Y is chlorine, bromine, iodine, hydrogen or OR, R is a hydrocarbon radical of 1 to 12 carbon atoms and p is a number from 0 to 3, to form a solid-phase product (III), the weight ratio of the inorganic oxidic material (I) employed to the aluminum compound (II) employed being from 1:0.05 to 1:10, and then

(1.2) bringing the solid-phase product (III) obtained from stage (1.1) into contact with a magnesium compound (IV), dissolved in an organic solvent, to form a solid-phase product (V), the weight ratio of solid-phase product (III) employed to magnesium compound (IV) employed being from 1:0.01 to 1:0.25, the magnesium compound (IV) being a manasseite of the formula $Mg_6.Al_2.(OH)_{16}.CO_3.4H_2O$ and further being brought to a chlorine content of from 50 to 75 percent by weight by halogenation with phosgene, and finally

(1.3) bringing the solid-phase product (V) obtained from stage (1.2) into contact with a solid or liquid transition metal compound (VI) dissolved in an organic solvent, or a liquid transition metal compound (VI) without solvent, the transition metal being titanium and/or vanadium, to form a solid-phase product (VII), the weight raio of solid-phase product (V) employed to transition metal in the

transition metal compound (VI) employed being from 1:0.01 to 1:20.

4,175,171

CATALYST FOR POLYMERIZING α-OLEFINS

Akira Ito, Yokohama; Heizo Sasaki, Tokyo; Masanori Osawa, Yokohama; Tetsuya Iwao, Zushi, and Kenji Iwata, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,690

Claims priority, application Japan, Aug. 2, 1976, 51-91330; Aug. 4, 1976, 51-91331; Apr. 4, 1977, 52-37651

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—125 **17 Claims**

1. A catalyst for polymerizing α-olefins comprising:

(A) A titanium composition obtained by heat-treatment of:

(1) a comminuted mixture of 10–95% by weight of a magnesium dihalide and 90–5% by weight of a complex consisting of AlX_3, wherein X is a halogen, and a carboxylic acid ester of the formula

$$R^1COOR^2$$

wherein R^1 and R^2 are the same or different and selected from the group consisting of aromatic, aliphatic and alicyclic radicals having 1–12 carbon atoms, the molar ratio of said carboxylic acid ester to said aluminum halide being approximately 1:1; and

(2) liquid titanium tetrachloride in an amount whereby Ti constitutes 0.1–10% by weight of (A); and

(B) an organic aluminum compound of the formula

$$AlR^3{}_mH_{3-m}$$

wherein R^3 is an alkyl radical having 1–12 carbon atoms and m is $1.5 \leqq m \leqq 3$;

wherein (B) is present in an amount whereby the atom ratio of, titanium in (A) to aluminum in (B) is in the range of 1:1–300.

4,175,172

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

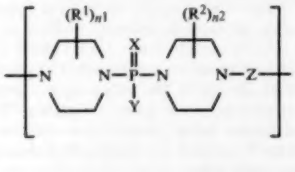
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 22, 1978, Ser. No. 918,137

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] C08G *77/22*

U.S. Cl. 528—27 **16 Claims**

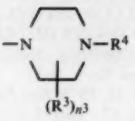
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an n-containing heterocyclic group; or —OR or $-NR_2$; or $-NR_2$ in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula:

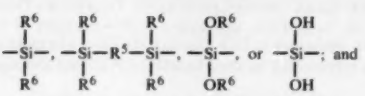


wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents



(vi) R^5 or R^6 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or an N-containing heterocyclic radical.

4,175,173

POWDER COATING COMPOSITIONS CONTAINING AN EPOXIDE RESIN AND AN ACID HARDENER

Madan M. Bagga, Cambridge, and Noel S. Moss, Duxford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

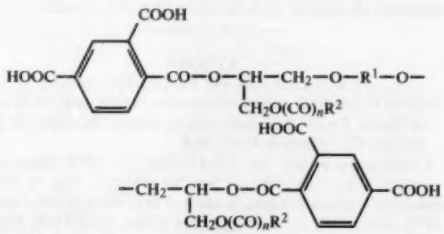
Filed Sep. 8, 1978, Ser. No. 940,678

Claims priority, application United Kingdom, Sep. 9, 1977, 37685/77

Int. Cl.[2] C08G *59/42*

U.S. Cl. 528—97 **10 Claims**

1. Solid, curable compositions in powder form, comprising 100 parts by weight of an epoxide resin and 10 to 30 parts by weight of a carboxylic acid of formula



where

R^1 represents a phenylene or naphthylene group, or a group comprising two or three phenylene radicals linked by one or two carbon-carbon bonds, one or two ether oxygen atoms, one or two sulfur atoms, or by one or two sulfonyl, sulfoxide, carbonyl, or alkylene groups of 1 to 6 carbon atoms, and

either both n represent zero, in which case R^2 represents a saturated alkyl group of 1 to 16 carbon atoms, a benzenoid group of 6 to 12 carbon atoms, or an aralkyl group of 7 to 16 carbon atoms, or

both n represent 1, in which case R^2 represents a saturated alkyl group of 1 to 3 carbon atoms, a benzenoid group of 6 to 12 carbon atoms, or an aralkyl group of 7 to 16 carbon atoms.

4,175,174

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

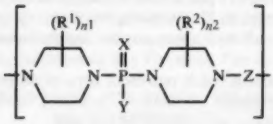
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 19, 1978, Ser. No. 916,617

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] C08G *69/26*

U.S. Cl. 528—168 13 Claims

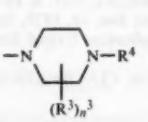
1. A solid polymer consisting essentially of repeating units of the formula



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula

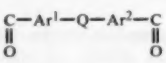


wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents



(vi) Ar^1 and Ar^2 represent arylene; and

(vii) Q represents —O—, or —S—, or —SO—.

4,175,175

POLYARYLENE POLYETHERS

Robert N. Johnson, New Market, and Alford G. Farnham, Mendham, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 230,091, Feb. 28, 1972, Pat. No. 4,108,837, which is a continuation-in-part of Ser. No. 688,302, Dec. 6, 1967, abandoned, which is a continuation-in-part of Ser. No. 446,715, Apr. 8, 1965, abandoned, which is a continuation-in-part of Ser. No. 295,519, Jul. 16, 1963, abandoned. This application May 8, 1978, Ser. No. 903,569

The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.

Int. Cl.[2] C08G *65/40*

U.S. Cl. 528—125 10 Claims

1. A substantially linear thermoplastic polyarylene polyether composed of recurring units of the general formula:

$$+O-E-O-E'+$$

where E is the residuum of a dihydric phenol and E' is the residuum of a benzenoid compound having an electron withdrawing group in at least one of the positions ortho and para to the valence bonds, having a sigma* value sufficient to activate halogens in the said valence positions to a level adequate to react with an alkali metal phenolate; wherein both of said residua are valently bonded to ether oxygens through aromatic carbon atoms, with the proviso that E may not be the residuum of a bis(hydroxyphenyl) sulfone where E' is the residuum of bis(halophenyl) sulfone and with the further proviso that E may not be the residuum of hydroxybenzohydroxyphenone when E' is the residuum of halobenzohalophenone.

4,175,176

SOLVENT RESISTANT ACRYLIC RESIN COMPOSITION

Kohe Ozawa, Yokohama; Kazuhiro Hosoya, Tokyo; Jiro Kurita, Yokohama, and Makoto Honda, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabusihiki Kaisha, Osaka, Japan

Filed Jun. 3, 1977, Ser. No. 803,283

Int. Cl.[2] C08F *220/14*

U.S. Cl. 526—309 8 Claims

1. A solvent resistant acrylic polymer having a viscosity-average molecular weight of 100,000 to 4,000,000 determined according to the formula $[\eta]=KM_w^{\alpha}$ where:

M_w = viscosity-average molecular weight

$K=4.85\times10^{-6}$

$\alpha=0.80$

$[\eta]$ = intrinsic viscosity of chloroform solutions of the acrylic [resin composition] polymer at 25° C.,

and consisting essentially of (A) at least 1% by weight, based on the total weight of the components (A), (B) and (C), of monomer units of at least one of (C_3–C_8) alkyl esters of acrylic acid; (B) methyl acrylate monomer units; and (C) 80 to less than 90% by weight, based on the total weight of the components (A), (B) and (C), of methyl methacrylate monomer units; the amount of the component (B) being the same as or more than that of the component (A).

4,175,177

CROSSLINKABLE COPOLYMER OF A LACTONE AND A POLYFUNCTIONAL ACRYLATE

James E. Potts, Somerset, N.J., assignor to Union Carbide Corporation, New York, N.Y.

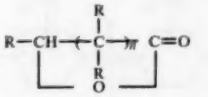
Filed Feb. 24, 1978, Ser. No. 880,955

Int. Cl.[2] B01F *11/00*

U.S. Cl. 528—354 13 Claims

1. Process of producing a thermoplastic crosslinkable copolymer which comprises reacting, at a temperature of from 25 to 300° C., an active-hydrogen containing initiator with a molar excess of a monomer mixture comprising:

(A) from 90 to 99.5 weight percent of a lactone monomer of the formula



wherein n is an integer having a value from about 3 to 6, at least n+2 of the R's are hydrogen, and the remaining R's are each alkyl of 1 to 10 carbon atoms; and

(B) from 0.5 to 10 weight percent of a polyfunctional acrylate monomer containing a plurality of acrylate or methacrylate groups.

4,175,178

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

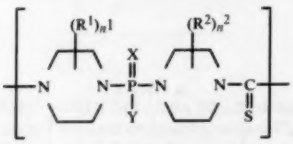
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 16, 1978, Ser. No. 916,400

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] **C08G** *75/00*

U.S. Cl. 528—373 **13 Claims**

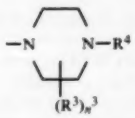
1. A solid polymer consisting essentially of repeating units of the formula



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group, or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group; and

(iv) n^1, n^2, and n^3 each represent zero or an integer.

4,175,179

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

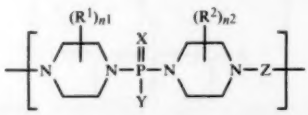
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 22, 1978, Ser. No. 918,136

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] **C08G** *75/18*

U.S. Cl. 528—381 **14 Claims**

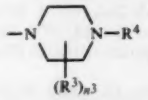
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents —SO_2—, —SO—, —$SO_2R^5SO_2$—, —SOR^5SO—, or —SO_2R^5SO—; and

(vi) R^5 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or a heterocyclic radical.

4,175,180

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

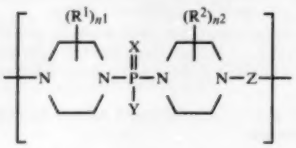
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 19, 1978, Ser. No. 916,625

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] **C08G** *79/02*

U.S. Cl. 528—399 **15 Claims**

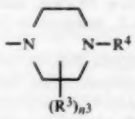
1. A solid polymer consisting essentially of repeating units of the formula



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphtic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula

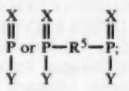


wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents



and

(vi) R^5 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or an N-containing heterocyclic radical.

4,175,181

POLYPHOSPHAZENE POLYMERS CONTAINING CYANAMIDO OR DICYANAMIDO SUBSTITUENTS

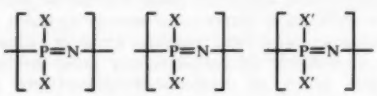
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,107

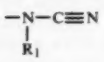
Int. Cl.[2] C08G *83/00*

U.S. Cl. 528—168 **18 Claims**

1. A polyphosphazene polymer containing unit represesented by the formulas:



wherein X is



in which R_1 is independently selected for each unit from the group consisting of hydrogen and CN and wherein X′ is the same as X or is selected from the group consisting of substituted and unsubstituted alkoxy, aryloxy, amino, and mercapto radicals and mixtures of the radicals.

4,175,182

SEPARATION OF HIGH-ACTIVITY HEPARIN BY AFFINITY CHROMATOGRAPHY ON SUPPORTED PROTAMINE

Gottfried Schmer, Seattle, Wash., assignor to Research Corporation, New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,795

Int. Cl.[2] C07H *1/06*

U.S. Cl. 536—21 **7 Claims**

1. An affinity chromatography method for the separation of heparin having a specific activity of at least about 270 IU/mg from a mixture thereof with heparin of lower specific activity, comprising the steps of:

(a) preparing a solution of said heparin mixture in a solvent of about 0.6 molar sodium chloride buffered with about 0.01–0.03 molar imidazole to pH 6.5–7.5;

(b) applying said heparin solution onto an affinity column composed of protamine coupled to a water-insoluble solid support material; and

(c) successively eluting a plurality of heparin fractions from said affinity column with a series of elution buffers of successively increasing molarity of sodium chloride buffered with about 0.01–0.03 molar imidazole to pH 6.5–7.5, said elution buffers having a sodium chloride molarity ranging from about 1.3 to about 2.0, so as to effect a stepwise removal from said affinity column of first the heparin of lower specific activity and finally the heparin having a specific activity of at least about 270 IU/mg.

4,175,183

HYDROXYALKYLATED CROSS-LINKED REGENERATED CELLULOSE AND METHOD OF PREPARATION THEREOF

John S. Ayers, Heslington, England, assignor to Development Finance Corporation of New Zealand, Wellington, New Zealand

Continuation-in-part of Ser. No. 773,269, Mar. 1, 1977. This application May 24, 1978, Ser. No. 909,165

Int. Cl.[2] C08B *11/08, 11/193, 15/10*

U.S. Cl. 536—57 **11 Claims**

1. A water insoluble, hydrophilic, water swellable hydroxy C_2–C_4 alkylated cross-linked regenerated cellulose prepared from the reaction of up to 20% (V/W based on cellulose) cross-linking agent comprising a bifunctional compound of formula XRY wherein X and Y which may be the same or different is each halo or epoxy and R is an aliphatic residue, up to 100% (V/W based on cellulose) hydroxy C_2–C_4 alkylating agent and regenerated cellulose.

4,175,184

MANUFACTURE OF 2,1,3-THIADIAZIN-4-ONE-2,2-DIOXIDE DERIVATIVES

Hans Merkle; Albrecht Mueller, and Karl Zoller, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

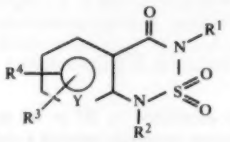
Filed Feb. 21, 1978, Ser. No. 879,722

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710382

Int. Cl.[2] C07D *285/22*

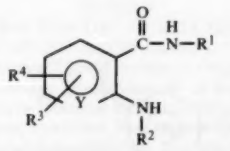
U.S. Cl. 544—10 **7 Claims**

1. A process for the production of a compound of the formula

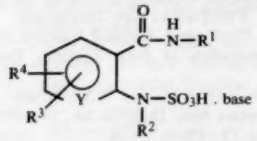


where R^1, R^2 and R^3 are identical or different and each is hydrogen, unsubstituted aliphatic, cycloaliphatic or aromatic hydrocarbon radicals, or aliphatic, cycloaliphatic or aromatic hydrocarbon radicals substituted by halogen, alkyl, alkoxy, haloalkoxy, alkylsulfonyl or dialkylamidosulfonyl, R^1 additionally may be dialkylamino, R^3 additionally may be halogen or trifluoromethyl, R^4 is hydrogen or alkyl, and Y is a

group optionally substituted by R^3 or R^4 or Y is a —N— group, which process comprises reacting a carboxamide compound of the formula

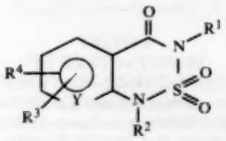


where R^1, R^2, R^3, R^4 and Y have the above meanings, with sulfur trioxide or chlorosulfonic acid in the presence of an organic base, or with adducts of sulfur trioxide and organic bases, to give the corresponding sulfamic acid salt of the formula



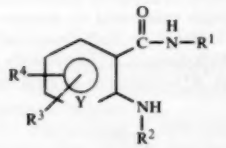
where R^1, R^2, R^3, R^4 and Y have the above meanings, and then cyclizing said sulfamic acid salt with the aid of a compound selected from the group consisting of acid halides and acid anhydrides.

7. A process for the production of a compound of the formula

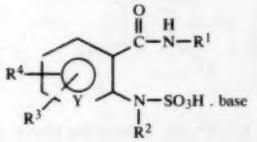


where R^1, R^2 and R^3 are identical or different and each is hydrogen, unsubstituted aliphatic, cycloaliphatic or aromatic hydrocarbon radicals, or aliphatic, cycloaliphatic or aromatic hydrocarbon radicals substituted by halogen, alkyl, alkoxy, haloalkoxy, alkylsulfonyl or dialkylamidosulfonyl, R^1 additionally may be dialkylamino, R^3 additionally may be halogen or trifluoromethyl, R^4 is hydrogen or alkyl, and Y is a

group optionally substituted by R^3 or R^4 or Y is a —N— group, which process comprises reacting a carboxamide compound of the formula



where R^1, R^2, R^3, R^4 and Y have the above meanings, with sulfur trioxide or chlorosulfonic acid in the presence of an organic base, or with adducts of sulfur trioxide and organic bases, to give the corresponding sulfamic acid salt of the formula



where R^1, R^2, R^3, R^4 and Y have the above meanings, converting said acid salt to the corresponding sulfamic acid, and then cyclizing said acid.

4,175,185

PROCESS FOR PREPARING CEPHALOSPORANIC ACID DERIVATIVES

Shigeo Seki, Tokyo; Satoru Nakabayashi; Toshinori Saito, both of Yokohama; Shunzo Fukatsu, Tokyo; Shokichi Nakajima, Yokohama, and Toshiyasu Ishimaru, Suita, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

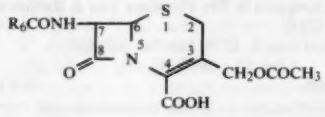
Continuation-in-part of Ser. No. 792,799, May 2, 1977, abandoned. This application Mar. 31, 1978, Ser. No. 892,179

Claims priority, application Japan, May 19, 1976, 51/56645

Int. Cl.[2] **C07D** *501/20*

U.S. Cl. 544—28 **16 Claims**

1. A process for preparing a cephalosporanic acid having the formula (V):



(V)

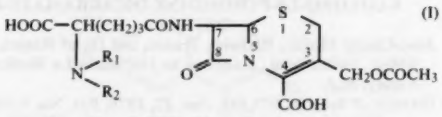
wherein R_6CO represents a 2-thienylacetyl group; an α-substituted-α-(2-thienyl)acetyl group wherein the substituent is a substituted or unsubstituted benzoyloxy group, a substituted or unsubstituted benzyloxy group, or a substituted or unsubstituted alkoxycarbonyloxy group having 2–3 carbon atoms; an α-substituted-α-phenylacetyl group wherein the substituent is halo, azido, hydroxy, alkanoyloxy having 2 to 5 carbon atoms, alkoxycarbonyloxy having 2 to 6 carbon atoms, halogenoalkanoyl having 2 to 3 carbon atoms, benzyloxycarbonyloxy, alkyltio having 1 to 2 carbon atoms, or alkoxycarbonyl having 2 to 5 carbon atoms; a substituted or unsubstituted benzyloxycarbonylamino group; a substituted or unsubstituted alkoxycarbonylamino group having 2 to 6 carbon atoms; a (carbamylalken-2-yl)amino group wherein the alken moiety has 2 to 3 carbon atoms; α-(t-butyloxy)-α-(p-methoxyphenyl)acetyl; α-valeryloxy-α-(p-nitrophenyl)acetyl; pyridylmercaptoacetyl; tetrazolylacetyl; aminocyclohexanecarbonyl; aminocyclohexadienylacetyl; aminocyclohexenylacetyl and cyanoacetyl;

which comprises

contacting an esterifying agent having the formula (II):

wherein R_3, R_4 and R_5 may be the same or different, each represents a hydrogen atom, alkyl having from 1 to 4 carbon atoms, phenyl, nitrophenyl, methoxyphenyl, benzoyl, benzyloxy, benzylthio, (C_1–C_4)alkanoyloxy, benzoxy or benzoyloxy, and X represents a chlorine atom, a bromine atom, an iodine atom, methanesulfonyloxy, benzenesulfonyloxy or p-toluenesulfonoxy,

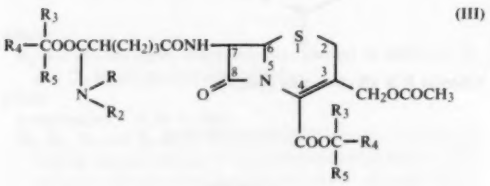
in liquid sulfur dioxide in the presence of a secondary or tertiary amine selected from the group consisting of diethylamine, monomethylaniline, piperidine, pyrrolidine, N,N′-tetramethylguanidine, triethylamine, tripropylamine, tributylamine, pyridine, picoline, lutidine, collidine, quinoline, isoquinoline, N-methylmorpholine, N-ethylmorpholine, N-methylpiperidine, N-ethylpiperidine, N-methylpyrrolidine, N-ethylpyrrolidine, N,N-dimethylaniline and N,N-diethylaniline, at a temperature of from about −10° to about −5° C., with an N-protected-cephalosporin C having the formula (I):



(I)

wherein R_1 represents a group selected from the group consisting of C_1–C_4 alkanoyl; benzoyl; nitrobenzoyl, halobenzoyl; C_1–C_5 alkoxycarbonyl; C_1–C_4 haloalkoxycarbonyl; (C_1–C_4)alkoxy-(C_1–C_4)alkoxycarbonyl; benzyloxycarbonyl; C_1–C_2 alkoxybenzyloxycarbonyl; halobenzyloxycarbonyl; phenyl substituted with nitro, methoxy, cyano or carbomethoxy; benzene sulfonyl; tosyl and nitrophenylsulfenyl; R_2 is hydrogen, or together with R_1 forms a ring selected from the group consisting of phthaloyl and halophthaloyl,

to form a diester having the formula (III):



(III)

wherein R_1, R_2, R_3, R_4 and R_5 are as defined above,

contacting the diester (III) in an inert solvent with an iminohalide forming agent at a temperature of from about −10° to about 0° C. to form an iminohalide,

contacting the iminohalide with a lower alcohol having from 1 to 4 carbon atoms to form an iminoether,

contacting the iminoether with an active derivative of an organic acid having the formula (IV):

$$R_6—COOH \qquad (IV)$$

wherein R_6CO is as defined above;

said active derivative being selected from the group consisting of an alkali metal salt of a mixed anhydride of said organic acid and sulfur trioxide; and a halide, an anhydride, an active ester, an azide, a cyanide, and an amide of said organic acid, to form a reaction product,

hydrolyzing said reaction product, and

converting the ester group at the 4-position of the ring to a carboxylic acid group.

4,175,186

BIOCIDALLY-ACTIVE, 1,3-BENZODITHIOLE-2-ONE AND 1,3-BENZODITHIOLE-2-THIONE COMPOUNDS

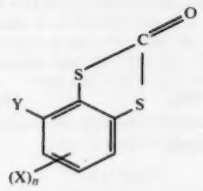
Khalid Rasheed, Weslaco, and James D. Warkentin, McAllen, both of Tex., assignors to The Ansul Company, Marinette, Wis.

Division of Ser. No. 618,255, Sep. 30, 1975, Pat. No. 4,084,954. This application Nov. 4, 1977, Ser. No. 848,721

Int. Cl.[2] **C07D** *413/02, 409/02, 339/06*

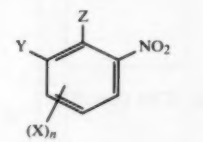
U.S. Cl. 544—145 **43 Claims**

1. A process for preparing compounds of the formula:



I

wherein Y is selected from hydrogen, cyano, alkylsulfonyl, nitro and trifluoromethyl; X is selected from alkyl and alkenyl of up to 6 carbon atoms, nitro, trichloromethyl, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, trifluoromethylsulfoxyl, trifluoromethylsulfonyl, methoxymethyl, cyano, carboxy, carbamyl, halogen, hydroxy, acetylamino, amino, N-phenylamino, N,N-diallylamino, alkoxy, N-morpholino, N-piperidino, N-piperazino, N-pyrrolidino, dimethylaminodithiocarbamyl, carboalkoxy, alkylthio, mono- and dialkylamino, N-alkylcarbamyl, N,N-dialkylcarbamyl, alkylsulfoxy, alkylsulfonyl, said alkyl groups containing from 1 to 4 carbon atoms and n is an integer from 0 to 3 which comprises reacting a nitrobenzene of the formula:



II

wherein Z is halogen, Y, X and n are as defined above;

with an N,N-dialkyldithiocarbamic acid or acid salt thereof, said alkyl group containing from 1 to 4 carbon atoms, straight- or branched-chained, and recovering product.

4,175,187

PROCESS FOR THE PREPARATION OF TERTIARY ALLYLIC AMINES FROM VINYLIC HALIDES AND OLEFINS

Richard F. Heck, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Filed Oct. 24, 1978, Ser. No. 954,184

Int. Cl.[2] **C07D** *295/02*

U.S. Cl. 544—170 **8 Claims**

1. The catalytic process of producing tertiary allylic amines from vinylic halides, with up to about 30 carbon atoms, which comprises reacting said halide with a mono-, di-, or tri-substituted ethylene, or ethylene itself with an unhindered basic secondary amine, in the presence of a palladium catalyst.

4,175,188

PROCESS FOR THE PRODUCTION OF 1,2,4-TRIAZIN-5-ONE DERIVATIVES

Herbert Klenk, Hanau; Werner Schwarze, Frankfurt, and Wolfgang Leuchtenberger, Bruchkobel, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

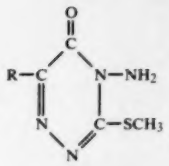
Filed Jul. 12, 1978, Ser. No. 924,062

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733180

Int. Cl.[2] **C07D** *253/06*

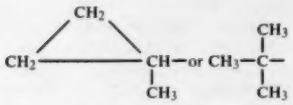
U.S. Cl. 544—182 **34 Claims**

1. A process for the production of a 1,2,4-triazin-5-one compound of the formula



(I)

where R is



are prepared by reacting under acid conditions an acyl cyanide of the formula

(II)

with either

(a) a tertiary alcohol of the formula

(III)

in which R′ is a t-alkyl group having 4 to 18 carbon atoms

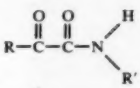
or

(b) an alkene of the formula

(IV)

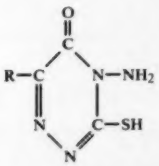
where R_1 and R_2 are hydrogen or alkyl and R_3 and R_4 are alkyl of 1 to 15 carbon atoms

to form an α-ketocarboxylic acid amide of the formula



(V)

and then either (1) reacting compound (V) with thiocarbohydrazide or (2) saponifying (V) to the free carboxylic acid and condensing the free carboxylic acid with thiocarbohydrazide to form a 1,2,4-triazin-5-one of the formula



(VI)

and then methylating the mercapto group.

4,175,189

6-CHLORO-2,4-PYRIMIDINE-DICARBAMATE-3-OXIDES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

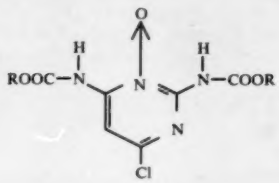
Division of Ser. No. 873,182, Jan. 27, 1978, Pat. No. 4,150,132. This application Dec. 22, 1978, Ser. No. 972,610

Claims priority, application Austria, Feb. 4, 1977, 738/77; Luxembourg, Dec. 5, 1977, 78639

Int. Cl.[2] C07D *239/48*

U.S. Cl. 544—323 **2 Claims**

1. A compound of the formula



VII

wherein R is alkyl or alkoxyalkyl.

4,175,190

6-CHLORO-2,4-PYRIMIDINE-DICARBAMATE-3-OXIDES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

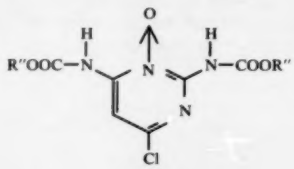
Division of Ser. No. 873,183, Jan. 27, 1978, Pat. No. 4,150,131. This application Dec. 26, 1978, Ser. No. 972,768

Claims priority, application Austria, Feb. 4, 1977, 745/77; Luxembourg, Dec. 5, 1977, 78640

Int. Cl.[2] C07D *239/48*

U.S. Cl. 544—323 **1 Claim**

1. A compound of the formula



wherein R″ is haloalkyl, aralkyl or aryl.

4,175,191

4-PHENYL ISOQUINOLINES

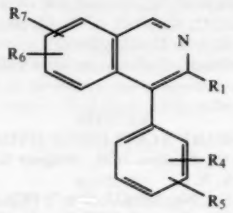
William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 705,703, Jul. 15, 1976, abandoned, which is a division of Ser. No. 542,843, Jan. 21, 1975, Pat. No. 3,989,704, which is a division of Ser. No. 411,074, Oct. 30, 1973, Pat. No. 3,872,125, which is a continuation-in-part of Ser. No. 339,616, Mar. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,860, Jun. 5, 1972, abandoned. This application Nov. 17, 1977, Ser. No. 852,503

Int. Cl.[2] C07D *217/02, 217/12*

U.S. Cl. 546—144 **4 Claims**

1. A compound of the formula



where

R_1 represents

where

R_2 and R_3 are each, independently, methyl or ethyl, or R_2 and R_3 together represent $(CH_2)_n$

where

n represents 4, 5, or 6, and

R_4, R_5, R_6 and R_7 each, independently, represent hydrogen, halo of atomic weight 19–36, trifluoromethyl, lower alkyl, or lower alkoxy, provided that R_6 and R_7 may not represent alkyl at the 8-position, and provided further that two trifluoromethyl groups or two tertiary butyl groups or a trifluoromethyl group and a tertiary butyl group are not on adjacent carbon atoms.

4,175,192

PROCESS FOR PREPARING QUININONE

Jean P. Gignier, 4 Rue de Capucins, and Jacques Bourrelly, 4 Ave. de Chateau, both of 92190, Meudom, France

Filed Jun. 13, 1978, Ser. No. 915,009

Int. Cl.² C07D *453/04*

U.S. Cl. 546—134 **18 Claims**

1. A process for oxidizing cinchona alkaloid to its corresponding ketone comprising reacting said cinchona alkaloid with a metal ketyl in an inert hydrocarbon solvent.

4,175,193

2-AMINO-3-CYANO-4-HYDROXYQUINOLINES

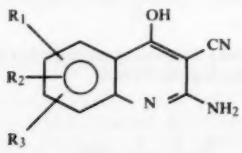
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 759,295, Jan. 14, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,738

Int. Cl.² C07D *215/56, 221/04*

U.S. Cl. 546—153 **6 Claims**

1. A compound having the formula:



(IV)

wherein each of R_1, R_2 and R_3 is selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, chloro, bromo, fluoro, hydroxy, methylthio and methylsulfinyl, and R_2 and R_3 when taken together are selected from the group consisting of 1,3-butadienyl and alkylenedioxy having from 1 to 2 carbon atoms.

4,175,194

PIPERIDINYLDITHIOCARBONIC ACID DERIVATIVES

Lawrence H. Nash, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 888,744, Mar. 21, 1978. This application Jun. 2, 1978, Ser. No. 911,879

Int. Cl.² C07D *295/18*

U.S. Cl. 546—189 **4 Claims**

1. The compound, Bis piperidinyldithiocarbonylsulfoxide.

4,175,195

PROCESS FOR THE PRODUCTION OF SUBSTITUTED PYRIDINE (A)

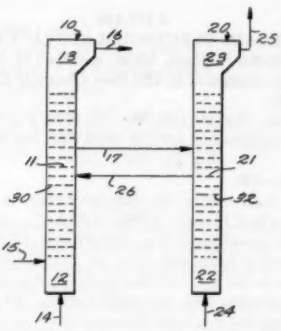
Helmut Beschke; Heinz Friedrich, and Heribert Offermanns, all of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,984

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639701

Int. Cl.² C07D *213/12*

U.S. Cl. 546—250 **20 Claims**



1. A process for the production of a pyridine having an aromatic or heteroaromatic substituent in the 2-position comprising catalytically reacting a aliphatic-aromatic or aliphatic-heteroaromatic ketone with an aliphatic oxo compound having a carbon to carbon ethylenic double bond on the carbon adjacent to the oxo group and ammonia in the gas phase at a temperature from about 250° to 550° C. in the presence of a dehydrating and dehydrogenating catalyst which is (1) a catalyst consisting essentially of oxygen containing compounds of Al, F. at least one of the elements B and Si and at least one element from the second and fourth groups of the periodic system selected from the group consisting of Mg, Ba, Zn, Sn, and Zr, said catalyst having been prepared by heating in the presence of oxygen at a temperature of 600° to 800° C.;

1. aluminum, aluminum oxide or an aluminum compound convertible to the oxide at a said temperature,
2. a compound of fluorine, said fluorine having been added as ammonium fluoride, ammonium hydrogen fluoride, hydrogen fluoride, fluoboric acid, fluosilicic acid, boron trifluoride, magnesium fluoborate, magnesium fluosilicate, zinc fluosilicate or barium fluosilicate,
3. boron, silicon, boric oxide, silica or a compound of boron or silica convertible to the oxide at said temperature and
4. magnesium, zinc, tin, zirconium, magnesium oxide, zinc oxide, tin oxide or a compound of zirconium or barium convertible to the oxide at said temperature, the atomic ratio of Al to F being from 1000:25 to 1000:800 and the atomic ratio of Al to the total of (3) and (4) being from 1000:5 to 1000:200, the atomic ratio of the total of boron and silicon to the other element from the second and fourth groups being between 1 to 10 and 10 to 1 or (2) a catalyst having been prepared by heating at 600° to 800° C. in the presence of gaseous oxygen (1) aluminum metal,

aluminum oxide, or a compound of aluminum convertible to the oxide upon heating with gaseous oxygen at 600° to 800° C., (2) ammonium fluoride, hydrogen fluoride or a fluoride of an element of the second main group of the periodic system and (3) at least one element of the second main group of the periodic system, the oxide of said element or a compound of said element convertible to the oxide in the presence of gaseous oxygen at a temperature of 600° to 800° C., said catalyst consisting essentially of the elements Al, F, O and the element of the second main group of the periodic system or (3) a catalyst consisting essentially of the product obtained by treating with oxygen at a temperature of 550° to 1200° C. compounds of the elements Al, F and O and at least two other elements selected from the second, fourth, fifth and sixth groups of the periodic system, said two other elements being selected from the group consisting of Mg, Ba, Zr, Sn, Ti, P, Ta, Sb and S, the ratios of the elements being Al to F of between 1,000 to 10 and 1,000 to 800 and of Al to the elements of the second, fourth, fifth and sixth groups being between 1,000 to 5 and 1,000 to 200.

4,175,196
CERTAIN PYRIDINIUM SURFACTANTS

Robert F. Harris, Midland, Mich., and Earl H. Wagener, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 416,308, Nov. 15, 1973, Pat. No. 4,093,663. This application Apr. 12, 1978, Ser. No. 895,558

Int. Cl.[2] **C07D** *213/30*

U.S. Cl. 546—339 **12 Claims**

1. An onium surfactant corresponding to the formula $X[(CH_2CH_2O)_mCH_2—R—CHR'—Q^{\oplus}A^{\ominus}]_n$, wherein X is a hydrophobic n-valent radical derived by the removal of n-atoms of active hydrogen from an organic compound and corresponds to the hydrophobic portion of a nonionic surfactant having a hydrophilic-lipophilic-balance of from 1 to about 30 and having the structural formula $X[(CH_2CH_2O—_mH]_n$; m is an integer of at least 1 and is the same in each of the above formulae; R is a divalent aromatic hydrocarbon radical of from 6 to about 14 carbon atoms, the chain length of which can be interrupted by oxygen or sulfur atoms; R' is hydrogen or methyl and is methyl only when R is m- or p-phenylene; $Q^{\oplus}$ is a pyridinium radical; $A^{\ominus}$ is a compatible anion; and n is an integer of from 1 to 5 and is the same in each of the formulae.

4,175,197
1,3,4-TRISUBSTITUTED-4-ARYL-1,4,5,6-TETRAHYDROPYRIDINES

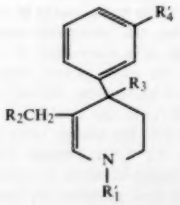
Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 852,252, Nov. 17, 1977, Pat. No. 4,115,400, which is a division of Ser. No. 690,767, May 27, 1976, Pat. No. 4,081,450, which is a continuation of Ser. No. 503,581, Sep. 6, 1974, abandoned. This application May 12, 1978, Ser. No. 905,494

Int. Cl.[2] **C07D** *213/04, 213/30*

U.S. Cl. 546—339 **9 Claims**

1. A compound of the formula



wherein:

R_1' is C_1–C_8 alkyl, C_3–C_6 cycloalkyl-C_1–C_3 alkyl, or benzyl;

R_2 is hydrogen, C_1–C_4 alkyl, or C_2–C_6 alkenyl;

R_3 is C_1–C_4 alkyl, or C_2–C_6 alkenyl;

and R_4' is hydrogen, hydroxy, or C_1–C_3 alkoxy.

4,175,198
5-SECONDARY ALKYLIDENE HYDANTOINS

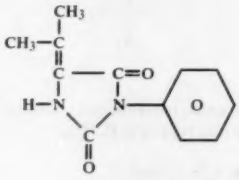
Roger R. Gaudette, Nashua, N.H., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 730,425, Oct. 7, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,279

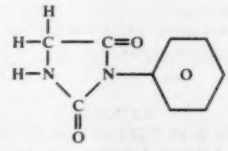
Int. Cl.[2] **C07D** *233/74*

U.S. Cl. 548—308 **32 Claims**

1. A process for preparing a first hydantoin having the formula

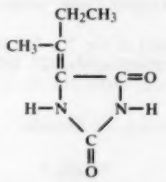


the process comprising condensing acetone and a second hydantoin having the formula

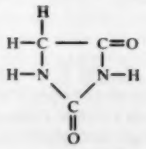


in the presence of (a) a catalyst selected from the group consisting of ammonia or a primary amine having a pK_b between about 3 and about 5, and (b) a polar diluent selected from the group consisting of water or an admixture of water with a lower alkanol having 7 or fewer carbon atoms per molecule; in said reaction mixture the amount of diluent being from about 150–1,000 ml of diluent per mole of the hydantoin and wherein the molar hydantoin:catalyst:ketone ratio is 1:0.1–10:0.5–4.

17. A process for preparing a product hydantoin having the formula



the process comprising condensing methyl ethyl ketone and a second hydantoin having the formula



in the presence of (a) a catalyst selected from the group consist-

ing of ammonia or a primary amine having a pK_b between about 3 and about 5, and (b) a polar diluent selected from the group consisting of water or an admixture of water with a lower alkanol having 7 or fewer carbon atoms per molecule; in said reaction mixture the amount of said diluent being from about 150–1,000 ml of diluent per mole of the hydantoin and wherein the molar hydantoin:catalyst:ketone ratio is 1:0.1–10:0.5–4.

4,175,199

SUBSTITUTED ACYL DERIVATIVES OF AMINO ACIDS

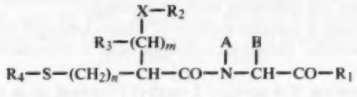
Miguel A. Ondetti, Princeton, and Frank L. Weisenborn, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 889,768, Mar. 24, 1978, Pat. No. 4,140,864, which is a division of Ser. No. 747,280, Dec. 3, 1976, Pat. No. 4,116,962. This application Dec. 4, 1978, Ser. No. 966,283

Int. Cl.[2] C07D *233/64*

U.S. Cl. 548—336 **8 Claims**

1. A compound of the formula



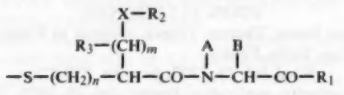
and non-toxic, physiologically acceptable salts thereof, wherein

R_1 is hydroxy or lower alkoxy;

R_2 is hydrogen, lower alkyl or lower alkanoyl;

R_3 is hydrogen or lower alkyl;

R_4 is hydrogen, lower alkanoyl, benzoyl or



A is hydrogen, lower alkyl or hydroxylower alkylene;

B is imidazolyl-4-lower alkylene

X is oxygen or sulfur;

m is 0, 1, 2, 3 or 4; and

n is 0 or 1.

4,175,200

N,N-DISUBSTITUTED SULFONYL HYDRAZINES

Byron A. Hunter, Woodbridge, and Franklin H. Barrows, Beacon Falls, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 638,474, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 567,169, Apr. 11, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,484

Int. Cl.[2] C07C *143/825, 143/83, 143/833*

U.S. Cl. 560—1 **6 Claims**

1. An N,N'-disubstituted sulfonyl hydrazine having the formula

$$R(SO_2NR^1NHR^2)_n,$$

wherein R is a C_1–C_{12} alkyl radical, a C_6–C_{12} aryl radical, a C_7–C_{12} aralkyl or alkaryl radical, a C_5–C_9 cycloalkyl radical or a group of the structure $—R^5—A—R^6$-wherein A is (1) a single bond connecting R^5 and R^6, (2) —O—, (3) —S—, (4) —SO—, (5) $—SO_2—$, (6) a C_1–C_6 alkylene or (7) a C_2–C_3 alkylidene and R^5 and R^6 are each independently selected from the group consisting of C_1–C_4 alkylene and phenylene; R^1 and R^2 are each $—COOR^3$; R^3 is a C_1—C_{12} alkyl, a C_5–C_9 cycloalkyl, a C_6–C_{12} aryl, or a C_7–C_{12} alkaryl or aralkyl radical; and n is 1 or 2.

4,175,201

CHEMICAL SYNTHESIS

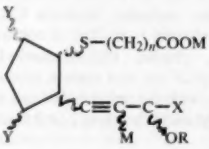
Josef Fried, Chicago, Ill., assignor to University of Chicago, Chicago, Ill.

Continuation-in-part of Ser. No. 274,365, Jul. 24, 1972, abandoned, and Ser. No. 400,297, Sep. 24, 1973, abandoned, which is a continuation of Ser. No. 361,664, May 18, 1973, abandoned, which is a continuation of Ser. No. 53,663, Jul. 9, 1979, abandoned. This application Apr. 18, 1977, Ser. No. 788,503

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—17 **3 Claims**

1. A compound of the formula,



wherein

M is H, or lower alkyl;

Y is H, OH, acyloxy or lower alkoxy;

X is alkyl of from 4 to 8 carbon atoms;

R is H, acyl or lower alkoxy;

n is an integer from 2 to 5; and

wherein the acyl moiety is derived from hydrocarbon carboxylic acids of twelve carbon atoms or less.

4,175,202

4,5,6-TRINOR-3,7,-INTER-M-PHENYLENE PROSTAGLANDIN A_1 ANALOGS

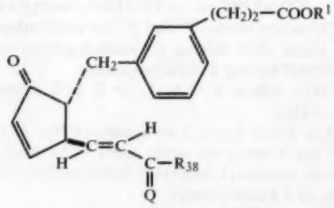
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 764,359, Jan. 31, 1977, Pat. No. 4,118,577, which is a continuation-in-part of Ser. No. 677,874, Apr. 19, 1976, abandoned, which is a division of Ser. No. 604,158, Aug. 13, 1975, abandoned. This application Jun. 29, 1978, Ser. No. 920,571

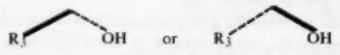
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—53 **62 Claims**

1. An optically active compound of the formula

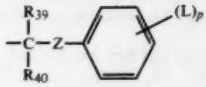


or a mixture comprising that compound and the enantiomer thereof, wherein Q is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the pharmacologically acceptable salts thereof when R_1 is hydrogen; wherein R_{38} is



wherein R_{39} and R_{40} are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_{39} and R_{40} is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_{39} nor R_{40} is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $CR_{39}R_{40}$— and the phenyl ring; and wherein L is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_{41}— wherein R_{41} is alkyl of one to 4 carbon atoms, inclusive, and p is zero, one, 2 or 3, with the proviso that not more than two L's are other than alkyl and when p is 2 or 3 the L's are either the same or different.

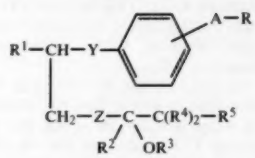
4,175,203

INTERPHENYLENE 11,12-SECOPROSTAGLANDINS

Edward J. Cragoe, Jr., and John B. Bicking, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 751,831, Dec. 17, 1976. This application Dec. 13, 1978, Ser. No. 968,890
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—55 **7 Claims**

1. The compound having the following formula:



wherein R is carboxy, a carboxy salt, or derivatized carboxy having the formula: —$COO^{\ominus}M^{+}$ wherein M^{+} is a pharmaceutically acceptable cation derived from a metal or an amine, or derivatized carboxy having the formula: —COOE, —$CONH_2$, —$CONR^6R^7$, or —$CONHNH_2$; wherein E is alkyl having 1–10 carbon atoms; R^6 and R^7 are each independently hydrogen, lower alkyl having 1–4 carbon atoms, or diloweralkylaminoalkyl having 4–7 carbon atoms;

A is $(CH_2)_n$ where n is 0, 1, or 2, and oxymethylene (—O—CH_2);

Y is $(CH_2)_n$ where n is 1, 2, or 3, and —CH_2—CH=CH—; and A and Y are in the ortho, meta, or para orientation;

R^1 is acetyl, propionyl, butyryl, 1-hydroxyethyl, 1-hydroxypropyl, or 1-hydroxybutyl;

Z is ethylene, vinylene, or ethynylene;

R^2 is independently hydrogen or methyl;

R^3 is hydrogen or lower alkanoyl;

R^4 is selected independently from the group consisting of hydrogen or methyl; and

R^5 is selected from the group consisting of lower alkyl of 3–6 carbon atoms, either straight or branched (propyl, butyl, amyl, isoamyl, hexyl, 3,3-dimethylbutyl), 3-butenyl, 4,4,4-trifluorobutyl, and lower alkoxy, OR^6, where R^6 is selected from the group consisting of lower alkyl of 2–5 carbon atoms, straight or branched (ethyl, propyl, butyl, hexyl, isobutyl, and 3,3,3-trifluoropropyl);

in addition, when R^5 is lower alkyl and R^2 is methyl, they can be joined together (with abstraction of hydrogen) to form a carbocyclic ring with from 6 to 9 members;

also, when R^5 is lower alkyl and R^2 is hydrogen, R^5 can be joined to the carbon atom bearing R^2 and OR^3 to form a carbocyclic ring with from 5 to 8 members;

provided that when R^3 is hydrogen, R is defined as derivatized carboxy having the formula: —$CONH_2$, —$CONR^6R^7$, or —$CONHNH_2$; R^6 and R^7 are each independently hydrogen, lower alkyl having 1–4 carbon atoms, or diloweralkylaminoalkyl having 4–7 carbon atoms.

4,175,204

METHOD OF PREPARING E-4-ACETOXY-2-METHYL-2-BUTENAL

James H. Babler, 125 Callan, Evanston, Ill. 60202

Continuation-in-part of Ser. No. 871,075, Jan. 20, 1978, abandoned. This application Jan. 8, 1979, Ser. No. 1,075
Int. Cl.[2] C07C *67/28*
U.S. Cl. 560—262 **10 Claims**

1. A process for synthesis of E-4-acetoxy-2-methyl-2-butenal comprising the following steps in sequence:

(a) forming a reaction mixture of 4-halo-3-methyl-2-buten-1-ol acetate, dimethyl sulfoxide, and a non-nucleophilic base;

(b) isolating E-4-acetoxy-2-methyl-2-butenal as a reaction product from said reaction mixture.

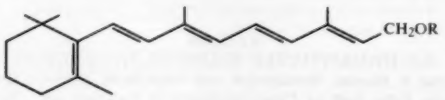
4,175,205

PROCESS FOR THE PREPARATION OF VITAMIN A FROM SULPHONES

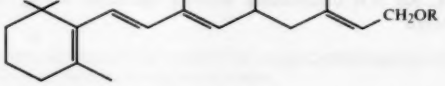
Jean-Pierre Decor, Thurins, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jul. 25, 1977, Ser. No. 818,871
Claims priority, application France, Jul. 28, 1976, 76 22992
Int. Cl.[2] C07C *69/14, 69/24*
U.S. Cl. 560—260 **6 Claims**

1. In a process for the preparation of a vitamin A derivative of the formula:



in which R represents hydrogen or COR_1, where R_1 is alkyl of 1 to 6 carbon atoms, by desulphonation of a sulphone of the formula:



in which R is defined as above and Ar represents unsubstituted or substituted aryl, the improvement which consists in carrying out the desulphonation at a temperature of 10° to 50° C. using at least 3 molecular proportions per molecule of the said sulphone of a potassium alcoholate of a primary or secondary, saturated, straight chain or branched chain aliphatic alcohol of 1 to 6 carbon atoms, in an anhydrous liquid hydrocarbon in which the said alcoholate is insoluble and is suspended in solid form.

4,175,206
PROCESS FOR PREPARING A HYDROXYPHENYLGLYCINE COMPOUND

Masaru Senuma, Takatsuki; Nobuhiko Ishihara, Neyagawa; Shigeru Nishimoto, Minoo; Eisaku Yamato, Kobe, and Noboru Shigematsu, Nishinomiya, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed May 8, 1978, Ser. No. 903,492
Int. Cl.[2] C07C *51/00*
U.S. Cl. 562—444 **2 Claims**

1. A process for preparing DL-hydroxyphenylglycine which comprises reacting phenol with a first compound selected from glyoxylic acid, ammonium glyoxidate, sodium glyoxidate, and potassium glyoxidate, and a second compound selected from ammonium alkanoate having one to three carbon atoms.

4,175,207
VISUAL-TYPE HYGROMETER

Stanley B. Elliott, 7125 Conelly Blvd., Bedford, Ohio 44146

Continuation of Ser. No. 547,811, Feb. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,526, Sep. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 245,494, Apr. 19, 1972, abandoned, which is a division of Ser. No. 18,921, Mar. 12, 1970, abandoned. This application May 9, 1977, Ser. No. 795,163
Int. Cl.[2] C07C *65/20*
U.S. Cl. 562—460 **7 Claims**

1. The solid, crystalline, hydrated, birefringent tetraalkali salts of 3,3′,4,4′ benzophenone tetracarboxylic acid consisting of the group of Li, K, Rb, and Cs.

2. A mixed crystal of the tetraalkali metal salts of 3,3′,4,4′ benzophenone tetracarboxylic acid in which at least two different alkali metals are present and function as equivalents to form solid, hydrated, crystals of the non-cubic system.

6. The solid, crystalline, hydrated, birefringent alkali metal salts of 3,3′,4,4′ benzophenone tetracarboxylic acid in which one hydrogen is left unneutralized.

7. A mixed crystal of the solid, crystalline, hydrated, birefringent alkali metal salts of 3,3′,4,4′ benzophenone tetracarboxylic acid in which one hydrogen is left unneutralized and at least two different alkali metals are present and function as equivalents.

4,175,208
PROCESS FOR THE PREPARATION OF 1-CHLORO-2-HYDROXY-3-NAPHTHOIC ACID

Frank Miller, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1979, Ser. No. 1,568
Int. Cl.[2] C07C *69/76*
U.S. Cl. 562—467 **3 Claims**

1. A process for the preparation of 1-chloro-2-hydroxy-3-naphthoic acid which comprises reacting, at a temperature below about 70° C., and aqueous alkaline solution of the dialkali metal salt of 2-hydroxy-3-naphthoic acid, containing at least 2 moles of an alkali metal hydroxide per mole of said 2-hydroxy-3-naphthoic acid, with an aqueous solution containing about 0.7 to 2.5 moles of an alkali or alkaline earth metal hypochlorite per mole of said dialkali metal salt.

4,175,209
PREPARATION OF 6,11-DIHYDRO-11-OXODIBENZ[B,E]-OXEPIN-2-ACETIC ACID AND PRECURSORS THEREFOR

Arthur R. McFadden, East Brunswick; Richard C. Allen, Flemington, and Thomas B. K. Lee, Whitehouse Station, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 843,482, Oct. 19, 1977, Pat. No. 4,118,401. This application Sep. 5, 1978, Ser. No. 939,111
Int. Cl.[2] C07C *63/59*
U.S. Cl. 562—473 **1 Claim**

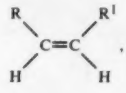
1. 4-benzyloxy-3-carboxyphenylacetic acid.

4,175,210
ETHERIFICATION PROCESS

Charles M. Selwitz, Monroeville, and John G. McNulty, Glenshaw, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Jun. 19, 1978, Ser. No. 916,969
Int. Cl.[2] C07C *41/06*
U.S. Cl. 568—689 **15 Claims**

1. A process for converting an unbranched olefin having from about 3 to about 14 carbon atoms or a mixture of unbranched olefins, having an unsaturated hydrocarbon structure:

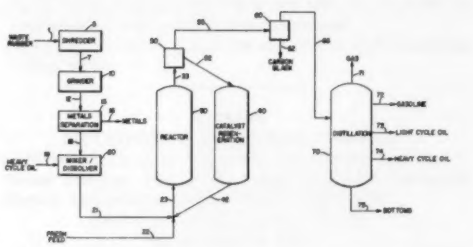


wherein R and R^1 and a hydrogen, a straight chain alkyl group or a straight chain alkenyl group containing from about 1 to about 12 carbon atoms but no more than one of said R and R^1 can be hydrogen, to an ether, or a mixture of ethers, which comprises passing a hydrocarbon alcohol and said olefin, or mixture of olefins, in a molar ratio of about 1:1 to about 15:1 in the vapor phase through a catalyst bed of silicatungstic acid at a liquid hourly space velocity of about 0.02 to about 2 volume of feed per volume of catalyst per hour at a temperature of about 50° to about 200° C. and a pressure of about 0.1 to about 10 atmospheres.

4,175,211
METHOD FOR TREATMENT OF RUBBER AND PLASTIC WASTES

Nai Y. Chen, Titusville, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 777,509, Mar. 14, 1977, Pat. No. 4,108,730. This application Mar. 1, 1978, Ser. No. 882,308
The portion of the term of this patent subsequent to Aug. 22, 1978, has been disclaimed.
Int. Cl.[2] C07C *3/26*
U.S. Cl. 585—241 **5 Claims**



1. A process for the conversion of solid plastic wastes selected from the group consisting of poly(halogenated hydrocarbons), poly(straight-chain olefins), and poly(vinyl aromatics) to distillates including a gasoline fraction which comprises:

(a) grinding the wastes,

(b) adding a selected petroleum-derived stream to the ground wastes,

(c) maintaining the resulting mixture at a temperature of about 150° to 700° F. for a sufficient time for dissolution to occur,

(d) feeding the resulting solution to a catalytic cracking zone operated at a temperature of 850° F. or more and a pressure from subatmospheric to 3 atmospheres,

(e) withdrawing a cracked product from the catalytic cracking zone, and

(f) distilling the cracked product to recover distillates including a gasoline fraction.

4,175,212
ELECTRICAL CONDUCTOR ASSEMBLY

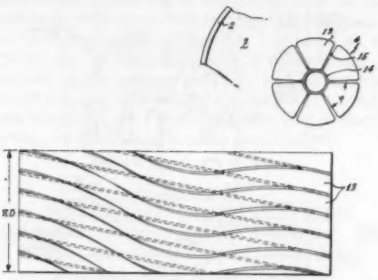
Jan Artbauer, Hanover, Fed. Rep. of Germany, assignor to Kabel- und Metallwerke Guthehoffnungshutte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,091

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649398; Mar. 3, 1977, 2712222

Int. Cl.[2] H01B *9/00*

U.S. Cl. 174—128 R **7 Claims**



1. A conductor assembly for use in an electrical cable for purposes of transmission of large quantities of electrical energy and being comprised of plural, segment shaped elements, arranged in one or several layers on a carrier element, the segments each having a small end in engagement with the carrier, further having a large end, the large ends delineating a periphery of the cable, each segment having two sides, the elements of a layer being placed with a gap between the sides of respective two adjacent ones of the elements and for the length of the conductor assembly to permit lateral displacement in a wave-like pattern upon being heated by a large electric current.

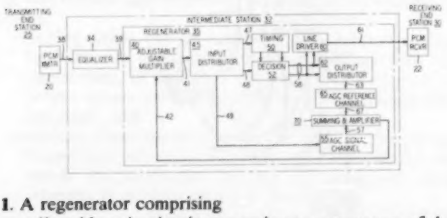
4,175,213
REGENERATOR HAVING AUTOMATIC GAIN CONTROL REFERENCED TO A DATA-PATTERN-DEPENDENT PULSE STREAM

William I. Chen, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 6, 1978, Ser. No. 957,831

Int. Cl.[2] H04L *25/20;* **H04B** *3/04*

U.S. Cl. 178—70 R **6 Claims**



1. A regenerator comprising

an adjustable gain circuit responsive to a sequence of data pulse signals for producing a data-pattern-dependent input signal,

means responsive to the input signal for producing a data-pattern-dependent detected signal,

means responsive to the input signal for regenerating a data-pattern-dependent output signal,

means responsive to the output signal for producing a data-pattern-dependent reference signal,

means for algebraically combining the detected signal with the reference signal to form a continuously-variable data-pattern-independent gain control signal, and

means for applying the continuously-variable data-pattern-independent gain control signal to the adjustable gain circuit for controlling the gain thereof.

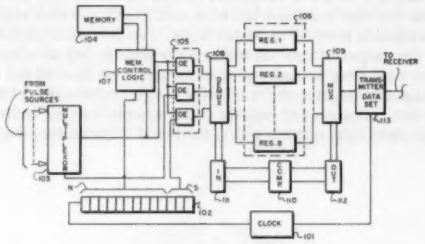
4,175,214
APPARATUS AND METHOD FOR A PULSE REGENERATION SYSTEM

William R. Wedmore, Glen Ellyn, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 7, 1978, Ser. No. 931,716

Int. Cl.[2] H04L *5/24*

U.S. Cl. 179—15 BW **11 Claims**



9. A pulse regeneration method for the transmission of information composed of a plurality of binary state changes of non-uniform time duration from a plurality of asynchronous pulse sources over a communication channel to processing equipment located remote to said pulse sources, comprising the steps of:

scanning said event sources for a determination of state change;

comparing said scanned present state value with the last-look value of said event source;

formulating a message describing the state change of the pulse source, its location and time of occurrence;

queuing said messages on a first-in, first-out basis for transmission at regular time intervals;

transmitting serially said queued messages via said communicaton channel;

receiving said transmitted messages sent over said communication channel;

converting said received messages to parallel form;

queuing said received messages for subsequent transfer to said processing equipment;

timing an appropriate predetermined interval in order to reconstruct said transmitted message; and

gating said queued messages one-at-a-time to said processing equipment.

4,175,215
MULTIPORT CONFERENCE CIRCUIT

Donald W. McLaughlin, Naperville, and Gerald F. Fetterer, Mount Prospect, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

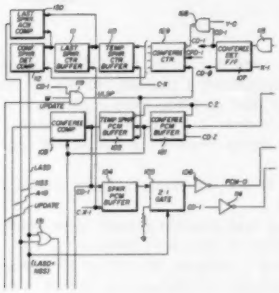
Filed Dec. 5, 1977, Ser. No. 857,168

Int. Cl.[2] H04M *3/56*

U.S. Cl. 179—18 BC **7 Claims**

1. In a pulse code modulated communication system, a plurality of communication channels arranged on a multiplexed basis, a switching system including a memory access by said communication channels and a conference circuit including, a first register connected to said memory operated to store the coded value of information from each of said channels conducted sequentially through said memory; a second register connected to said first register and including an output circuit; a first comparator circuit connected to said first and to said second registers operated to compare the coded value of information stored in said first and said second registers and in response to determination that the value of information stored in said first register is less than the value of information stored in said second register to provide an output signal; counting means connected to said memory periodically incremented in response to signals from said memory, a fourth register con-

nected to said counting means operated to store the count of said counting means, a fifth register connected to said fourth register, said count stored in said fourth register transferred to said fifth register in response to signals from said switching system, a second comparator circuit connected to said fourth and fifth registers operated in response to a determination that the count stored in said fourth and fifth registers are equal to provide an output signal; a third comparator circuit connected to said fourth and fifth registers operated in response to determination that the count stored in said fourth and fifth registers are equal to provide an output signal; a sixth register connected to the output of said second register and having an output to said switching system operated in response to a signal from said switching system for transfer of said coded value of information in said second register to said channels under control of said switching system; a first threshold comparator, the contents of said first register being connected to said first threshold comparator and the latter providing an output when said first register achieves an established threshold; a second threshold comparator, the contents of said second register being connected to said second threshold comparator and the latter providing an output when said second register achieves said established threshold; and gating means connected to said first, second and third comparator circuits and to said first and second threshold comparators selectively operated in response thereto to provide an output signal to update, said update signal being coupled to said first and second registers to operate them to transfer the coded value of information stored in said first register into storage in said second register, said update signal further being coupled to said first counting means to operate the latter to transfer the count in said first counting means into storage in said second counting means.



4,175,216

INTERCOM CALLING APPARATUS IN A KEY TELEPHONE SYSTEM

Gunzo Kita, and Koichi Sekiguchi, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

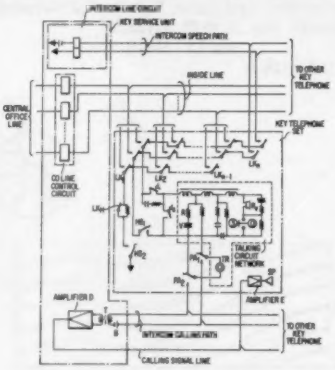
Continuation-in-part of Ser. No. 726,230, Sep. 24, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 897,286
Claims priority, application Japan, Oct. 13, 1975, 50/123062
Int. Cl.[2] H04M *1/72*
U.S. Cl. 179—99 A **3 Claims**

1. In a key telephone system wherein a plurality of key telephone sets are connected to a central office via a central office line, each of said key telephone sets having a transmitter, a talking circuit network, and a loudspeaker circuit for signalling an intercom call, and wherein each of said loudspeaker circuits signals said intercom call, an intercom calling apparatus comprising:

a two-position page switch;

means for electrically connecting the transmitter to the talking circuit network when the page switch is in a first position;

means for electrically connecting the transmitter to the loudspeaker circuit in each of said key telephone sets when the page switch is in a second position; and



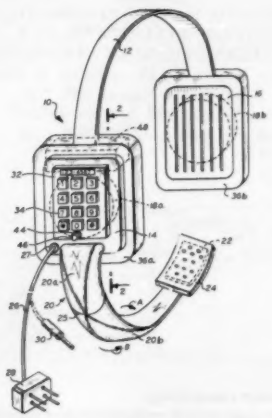
means for holding the connection of the talking circuit network with a central office line by a series combination of a resistor and a varistor forming a parallel circuit with the transmitter in the talking circuit network at the same time the page switch is changed to the second positon.

4,175,217

TELEPHONE HEADSET

Lewis M. Williams, 1205 College Ave., Bronx, N.Y. 10456

Filed Mar. 30, 1978, Ser. No. 891,700
Int. Cl.[2] H04M *1/05*
U.S. Cl. 179—156 R **2 Claims**



1. A telephone headset for connection to a telephone line, said headset having a pair of earphones and a microphone contained therein, said headset comprising:

a headstrap formed to span the head of a user;

first and second housings connected to said headstrap for placement adjacent the two ears of said user, said earphones being mounted in said housings for directing sound towards the user's ears;

a telephone dialing mechanism disposed one one of said housings on the surface thereof disposably remote from the user's ear;

an arm comprising two pivotally connected portions, one end of said arm being connected to the lower portion of

either one of said housings and the other end of said arm being connected to said microphone for positioning said microphone in the vicinity of the user's mouth;

signaling means disposed in said headset for alerting the user to an incoming call when said headset is operatively connected to said telephone line;

circuit network means disposed in said headset for coupling said earphone, said microphone, said dialing mechanism, and said signaling means to said telephone line; and

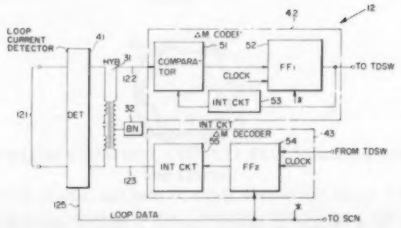
switch means connected to said circuit network means for selecting either a first operating state for said headset wherein said signaling means is connected to said telephone line for alerting the user to an incoming call, or a second operating state wherein said microphone, said earphones and said dialing mechanism are connected to said telephone line for enabling said user to place an outgoing call and converse using said headset.

4,175,218

TELEPHONE SWITCHING SYSTEM

Mitsutoshi Ayano, Tokyo, and Eiji Minamitani, Yokohama, both of Japan, assignors to Fujitsu Limited, Japan

Filed May 18, 1978, Ser. No. 907,197
Claims priority, application Japan, May 18, 1977, 52/57421
Int. Cl.[2] H04B *3/20*
U.S. Cl. 179—170.2 **10 Claims**



1. A switching system comprising at least two subscriber stations connected by a transmission line, each of said at least two subscriber stations comprising a two-wire circuit having a high impedance state and a low impedance state corresponding to an on-hook condition and an off-hook condition, respectively, at said each subscriber station, and hybrid means for converting said two-wire circuit to a four-wire circuit comprising said transmission line; said switching system further comprising:

detecting means, one for each subscriber station, for detecting a change in the impedance state, to said high impedance state, of said two-wire circuit of said each subscriber station, so as to generate a high impedance detecting signal, and

switching means inserted in said four-wire circuit responsive to said high impedance detecting signal from the detecting means for electrically opening said four-wire circuit, whereby to prevent singing in said system.

4,175,219

Patent Not Issued for This Number

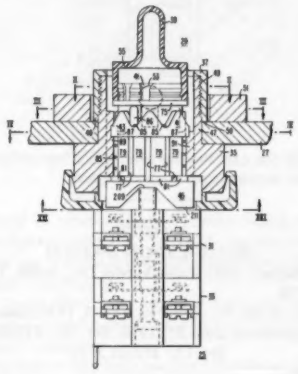
4,175,220

CONVERTIBLE SELECTOR SWITCH

Robert J. Johnston, Patterson Heights; Stephen G. Layciak, Brighton Township, Beaver County, and Stephen S. Dobrosielski, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1977, Ser. No. 858,323
Int. Cl.[2] H01H *3/00, 9/00*
U.S. Cl. 200—4 **9 Claims**

1. A rotary selector switch comprising a rotatable actuating unit, a tubular housing, said unit comprising an actuator within the housing and a switch handle on one end of the actuator, at least two switch structures mounted on the housing and operatively connected to the other end of the actuator, the handle being at one end of the housing and rotatable through one limited sector thereof, the handle being removable from the actuator for repositioning thereon in another limited sector of rotation, mutually interfitting means on the handle and actuator to enable said removal and repositioning, stop means for limiting rotation of said unit and comprising interengageable means between the handle and the housing, the interengageable means on the handle comprising a first pair of peripherally spaced ribs that are rotatable through one limited sector for one position of the handle, the interengageable means on the handle also comprising a second pair of peripherally spaced ribs that are rotatable through another limited sector for another position of the handle, the interengageable means also



comprising a pair of peripherally spaced guides on the housing, each rib having a stop surface on each side thereof and the peripheral spacing between the stop surfaces of each pair of ribs on one side being longer than the peripheral spacing between the stop surfaces of the ribs on the other side thereof, the interengaging means on the handle being located in the longer peripheral spacing when the handle is rotated through said one limited sector and located in the shorter peripheral spacing when the handle is rotated through said other limited sector, an operating cam on the other end of the actuator, each switch structure having a reciprocable contact operating member to effect opening and closing of a circuit through the switch structure, and the cam having cam operating surface means for actuating the contact operating members.

4,175,221

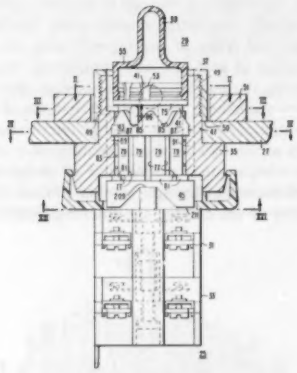
CONVERTIBLE SELECTOR SWITCH

Walter J. Kellogg, Beaver, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1977, Ser. No. 858,326
Int. Cl.[2] H01H *3/00, 9/00*
U.S. Cl. 200—4 **11 Claims**

1. A rotary selector switch comprising a rotatable actuating unit, a tubular housing, said unit comprising an actuator within the housing and a switch handle on one end of the actuator, at least two switch structures mounted on the housing and operatively connected to the other end of the actuator, the handle being at one end of the housing and rotatable through one limited sector thereof, the handle being removable from the actuator for repositioning thereon in another limited sector of rotation, stop means for limiting rotation of said unit and comprising interengageable means between the housing and the handle, mutually interfitting means on the handle and actuator to enable said removal and repositioning, the interengageable means being more proximate to each other for rotation of the handle through one limited sector than for another sector, an operating cam on the other end of the actuator, each switch

structure having a reciprocable contact operating member to effect opening and closing of a circuit through the switch



structure, and the cam having cam operating surface means for actuating the contact operating members.

4,175,222

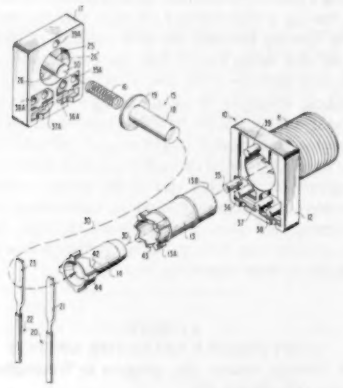
PUSHBUTTON SWITCH

Horace J. Buttner, 1501 Palos Verdes Dr., North, Harbor City, Calif. 90710

Continuation of Ser. No. 720,319, Sep. 3, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 873,030

Int. Cl.[2] H01H *3/12*

U.S. Cl. 200—159 R **10 Claims**



1. A pushbutton switch for electrically connecting a pair of conductors, each having coined ends retained in said switch, said switch comprising:

a housing including a barrel with an axis and head portion generally transverse to said axis,

a cover secured to said head with said coined conductor ends secured, in electrically non-contacting relation, between said head and cover,

said head and cover including insulating means to prevent an electrical connection between said conductors through either said head or said cover,

a contact moveable along said axis for bridging said coined ends for electrically connecting said conductors,

means mounting said contact for said axial movement to establish an electrical connection,

a plunger axially slidable in said barrel and engaging said mounting for projecting said mounting means in an axial direction,

biasing means yieldably biasing said contact, mounting means and plunger for return to a retracted position in which said contact bridges said conductors,

a ratchet mechanism on said housing and mounting means for retaining said mounting means in a projected position against the bias of said biasing means,

said plunger transmitting axial motion to said mounting means on a first stroke for operating said ratchet mechanism to retain said mounting means in a projected position at the conclusion of said stroke in which position said contact is out of engagement with said coined ends,

said plunger transmitting axial motion to said mounting means on a second stroke for operating said ratchet mechanism to allow said biasing means to return said contact and mounting means to a retracted position, in which position said contact is in engagement with said coined ends.

4,175,223

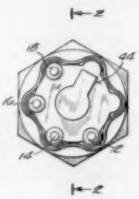
POSITION RESPONSIVE SWITCH

Richard L. Lauritsen, Hoffman Estates, and Richard S. Philbrick, Chicago, both of Ill., assignors to The Singer Company, New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 950,137

Int. Cl.[2] H01H *1/36, 15/06*

U.S. Cl. 200—159 R **6 Claims**



1. In a switching device having a hollow molded plastic body, a carrier mounted for axial movement in the body, spaced conductors fixed in the body parallel to each other and to the movement axis of the carrier, the improvement comprising a rib molded integrally with the body between the conductors, a shorting bar carried by said carrier for axial movement therewith and for movement transverse the axis into engagement with said conductors or with said rib, said rib having such height that it projects above a plane through the inner surface of both conductors and therefore prevents engagement of the shorting bar with the conductors, a cored hole through the body and the rib at a predetermined axial location so movement of the shorting bar into engagement with the conductors is unrestrained at said location.

4,175,224

APPARATUS FOR TRANSPORTING HEAVY EQUIPMENT ON A PIPELINE

Eugene F. Sims, and Trueman Dierlam, both of Houston, Tex., assignors to CRC-Crose International, Inc., Houston, Tex.

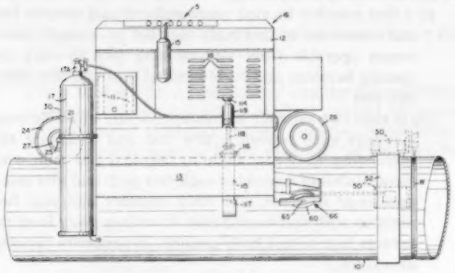
Filed Apr. 18, 1977, Ser. No. 788,550

Int. Cl.[2] B23K *37/02*

U.S. Cl. 219—60 R **10 Claims**

1. A carriage apparatus adapted to ride substantially in an upright position on and along a pipeline, for transporting and supporting heavy equipment such as welding power generating means and related equipment along said line which comprises, in combination, a carriage structure elongated along the line, power driven traction means at one end of said structure for supporting said structure on and propelling it along said line, a pair of swivel mounted laterally spaced wheels at the other end of said structure normally engaging sides of the pipeline and substantially below its top for imparting lateral stability thereto, a secondary pair of steering wheels adapted to engage the sides of the pipeline, sensing means for detecting

incipient tilting of the structure away from its normal substantially upright position, and means connected to and responsive



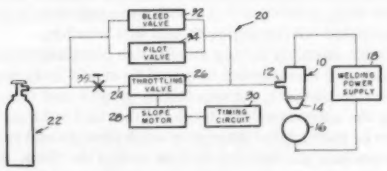
to operation of the sensing means for controlling the secondary steering wheels to restore the carriage to stable upright position in case of movement to incipient instability.

4,175,225

GAS FLOW CONTROL CIRCUIT FOR PLASMA ARC WELDING

Kenneth H. Holko, and John R. Odell, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Sep. 19, 1977, Ser. No. 834,415
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 P **12 Claims**



1. In plasma arc welding apparatus of a type having a plasma arc torch movable relative to a welding stock, the plasma arc torch including means for receiving orifice gas and means for transforming the orifice gas into a plasma jet stream and directing it toward the welding stock, a gas flow circuit for closely regulating the flow of orifice gas from a source to the receiving means of the plasma arc torch which comprises.

conduit means for interconnecting the source with the receiving means of the plasma arc torch,

a throttling valve arranged along said conduit means for controlling flow of the orifice gas from the source to the receiving means of the plasma arc torch,

a motor for operating said throttling valve, and

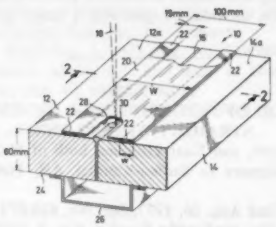
adjustable timing means coupled with said motor for selectively increasing, decreasing and maintaining at a steady state the flow of orifice gas through the throttling valve, said adjustable timing means including means for automatically upsloping the flow of orifice gas to initiate the weld and for automatically downsloping the flow of orifice gas for terminating the weld.

4,175,226

SEALING DEVICE FOR CHARGED PARTICLE BEAM WELDING

Erwin Kappelsberger; Peter Anderl, both of Munich, and Karl H. Steigerwald, Starnberg, all of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,003
Claims priority, application United Kingdom, May 11, 1977, 19830/77
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 EM **13 Claims**



1. A method of electron beam welding a gap or joint (16) between workpiece parts, each of which having an edge defining said joint and a surface extending from the edge;

said method comprising:

placing a longitudinal strip of metal foil over said joint and providing a vacuum-tight seal between said strip and said workpiece surfaces;

sealing the side of the joint opposed to said surfaces;

placing a movable vacuum chamber on, and sealing it with respect to said surfaces, said vacuum chamber comprising an electron gun for producing an electron beam for welding said joint;

evacuating said chamber and directing said beam onto and moving said chamber along said joint to form a weld seam;

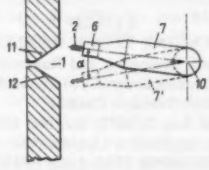
the improvement consisting in the additional step of severing a portion of said metal foil strip between the edges thereof within said vacuum chamber and lifting said portion from said workpiece surfaces.

4,175,227

PROCESS FOR AUTOMATICALLY VERTICALLY BUTT WELDING STEEL SHEET MATERIAL FOR CONTAINERS

Erich Kasper, Weisskirchen, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Dec. 20, 1977, Ser. No. 862,520
Claims priority, application Austria, Dec. 21, 1976, 9498/76
Int. Cl.[2] B23K *9/12*
U.S. Cl. 219—125.12 **14 Claims**



1. An automatic process for butt welding a vertical seam along a vertical butt joint between sheets of rust-proof and chemically resistant steels containing more than 2 percent by

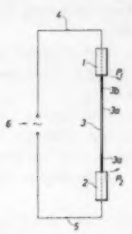
weight Ni, in which method the feed motion of a welding wire toward the weld seam, an oscillating movement of the welding wire transverse to the weld seam and the movement of the welding wire along the weld seam are automatically controlled and in which method the edges of the sheets are bevelled on one side only so as to form an open side of the butt joint, said method comprising performing the welding operation along the open side of the butt joint by providing an electrode having a maximum wire thickness of 1 mm, by oscillating the electrode over the whole width of the weld seam with a frequency of 70 to 140 double strokes per minute, by moving the electrode downwardly along the vertical weld seam and by keeping the welding area under a reactive gas atmosphere which contains carbon dioxide, oxygen and a major proportion of argon.

4,175,228

METHOD OF HOT BENDING A GENERALLY STRAIGHT WIRE BLANK

Venanzio Bizzari, and Enar Högfors, both of Hallstahammar, Sweden, assignors to Bulten-Kanthal AB, Hallstahammar, Sweden

Filed Aug. 26, 1977, Ser. No. 828,072
Claims priority, application Sweden, Sep. 3, 1976, 7609774
Int. Cl.[2] B21F *3/027*
U.S. Cl. 219—153 **10 Claims**



1. A method of hot bending a generally straight rod blank of ceramic material, having a diameter in the range of 0.4 to 0.1 mm, into a rod element having straight end portions and coils between said end portions, comprising the steps of

(a) clamping said end portions of said rod blank by means of two clamping jaws movable relative to one another while leaving a central portion, 40 to 100 mm in length, of said rod blank unclamped;

(b) conducting through said rod blank an electric current of such intensity that said rod blank is heated to a softening temperature of 1300° to 1600° C. in said central portion, while said end portions are kept at a temperature below 1300° C.; and

(c) moving at least one of said clamping jaws, during continued electric heating, along a path of movement adapted to a desired coil formation, whereby only said central rod portion is bent, while said end portions are kept substantially straight due to their lower temperature.

4,175,229

ENGINE BLOCK HEATER

Joseph B. Brinkhof, Brampton, and Raymond R. Datt, Mississauga, both of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Aug. 2, 1977, Ser. No. 821,240
Claims priority, application Canada, Nov. 12, 1976, 265449
Int. Cl.[2] H05B *3/02, 3/82;* **F02N** *17/06*
U.S. Cl. 219—208 **9 Claims**

1. A heater for insertion into an aperture in an engine block comprising

a body member having obverse and reverse faces,

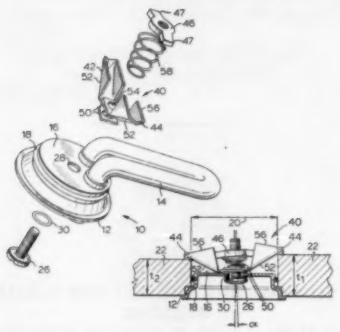
a metal sheathed heating element projecting from said reverse face,

a yoke assembly comprising

(i) a first member located rearwardly of said reverse face and connected to said body member by a single screw means operable from said obverse face to vary the spacing between said body member and said first member, and

(ii) at least two separate and independently movable wing members each having a first end and a second end subtending an obtuse angle to said first end, said wing members being assembled such that each said first end is positioned between said body member and said first member with said second ends diverging away from the reverse face of said body member in generally opposed directions,

said wing members being pivotally connected to said single screw means through a journal opening in each said first end, at least one of said wing members having said opening dimensioned so as to permit pivotal movement of that wing member in the axial plane of said screw,



said first member having portions thereof repectively slidable on the second end of each said wing member,

cheek members associated with said first member and each said wing member to retain said wing members in unitary assembled relationship with said first member,

said yoke assembly having an effective planform boundary, when said first member is spaced from said body member a certain distance, not appreciably greater than that defining the aperture of said block, so that said yoke assembly can be inserted into the engine block through said aperture to position said heating element within the block, and

actuation of said screw means so as to move said first member towards said body member causing the second end of each said wing member to describe an outward and forward path so as to increase said effective planform area whereby distal portions of each said wing member respectively engage internal peripheral portions of said engine block bounding said aperture.

4,175,230

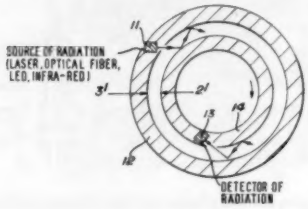
METHOD AND APPARATUS FOR TRANSFERRING CONTROL INFORMATION BETWEEN TWO MEMBERS

Gordon S. Richards, Paignton; Peter E. Douglas, Brixham, and Alan G. Abraham, Torquay, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 899,927
Claims priority, application United Kingdom, May 5, 1977, 18868/77
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **16 Claims**

1. Apparatus for transmitting information between two members one of which rotates relative to the other comprising:

first means fastened to one of said members for launching a beam of radiation modulated by said information;
second means fastened to the other of said members for detecting said beam; and
third means for constraining said beam to travel along a path extending between said members;
said two members including
a first element having an internal circular circumference,
a second element having an external circular circumference smaller than said internal circular circumference, said second element being disposed within said first



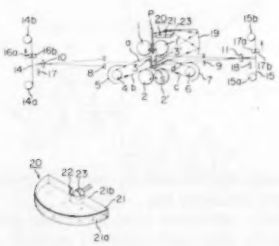
element with a gap therebetween, said information being transferred across said gap for any relative rotational position of said first and second elements, and
a reflector for said beam provided on each of said circular circumference;
said first means directs said beam through an aperture in said reflector on said first element into said gap, said beam passing around said gap by multiple reflections from said reflectors on said first and second elements until said beam reaches an aperture in said reflector on said second element through which said beam passes to said second means.

4,175,231

DEVICE FOR DETECTING A MOVING BODY

Shinji Murata, Tokyo, and Toshio Iwaya, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,707
Claims priority, application Japan, Sep. 28, 1976, 51-116258; Aug. 22, 1977, 52-100300
Int. Cl.[2] G02B *5/14*
U.S. Cl. 250—227 **12 Claims**



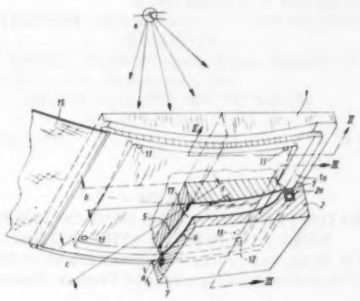
1. A device for detecting a moving body, comprising:
means for illuminating a moving body at a predetermined position along the path of movement of the body;
a photoguide member for receiving light reflected by the body, said photoguide member comprising a substantially transparent solid disc segment provided with a light receiving surface which defines a portion of a cylinder having its axis disposed along the axis of the disc segment and in parallel with the direction movement of the body, said transparent disc segment having parallel end surfaces, and having a concave surface disposed radially inward from said light receiving surface, wherein light directed from said light receiving surface is emitted from said concave surface, and wherein said light receiving surface is disposed adjacent said predetermined position along the path of movement of said body; and
a light receiving element located in opposition to said concave surface for receiving the light emitted from said photoguide member, said light receiving element including a photoelectric converter.

4,175,232

INOGRAPHY IMAGING METHOD AND CHAMBER

Jurgen Muller; Manfred Schmidt, and Rolf Eickel, all of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,960
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639444; Jan. 13, 1977, 2701202
Int. Cl.[2] B41M *5/00*
U.S. Cl. 250—315.2 **32 Claims**



1. In a method of exposing elastic dielectric receptor sheets in the gap between concentric first and second spherical electrodes of an ionography imaging chamber to object-modulated X-rays which issue from a source located nearer to one of the electrodes, the steps of maintaining said electrodes at a fixed distance from each other so that the width of said gap is constant at all times; introducing into the gap at least one receptor sheet; biasing at least a part of the margin of the introduced sheet against the adjacent portion of the imaging chamber; and thereupon admitting into the gap compressed high Z gas at one side of the introduced sheet at a pressure which suffices to deform the sheet in the gap and to maintain the deformed sheet in face-to-face contact with the first electrode while said part of the margin of the sheet is biased against said portion of the imaging chamber.

4,175,233

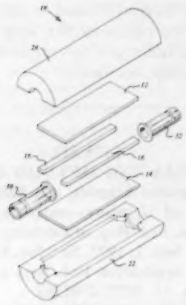
FLOW CELL AND METHOD FOR CONTINUOUSLY MONITORING DEPOSITS ON FLOW SURFACES

Vito A. DePalma, Tonawanda, and Robert E. Baier, Buffalo, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed May 26, 1978, Ser. No. 910,165
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—343 **8 Claims**

1. A demountable flow cell having an inlet and an outlet with a flow path therebetween and including:
a pair of mating housing members having corresponding recesses located therein;
first and second plates receivable in respective ones of said corresponding recesses;
shim means for separating said first and second plates when the flow cell is assembled and to define with said plates a portion of said flow path;

means for holding said housing members in an assembled, flight tight relationship while permitting disassembly of



said flow cell to permit direct examination of said plates defining said flow path.

4,175,234

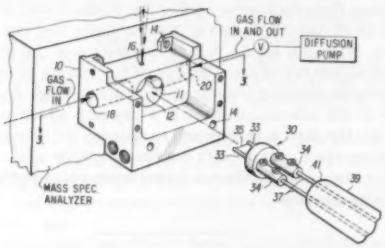
APPARATUS FOR PRODUCING IONS OF THERMALLY LABILE OR NONVOLATILE SOLIDS

Donald F. Hunt, and Jeffrey Shabanowitz, both of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Continuation of Ser. No. 822,216, Aug. 5, 1977, which is a continuation-in-part of Ser. No. 809,770, Jun. 24, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,151

Int. Cl.[2] H01J *27/00*

U.S. Cl. 250—427 **16 Claims**



1. A method for ionizing and vaporizing a nonvolatile solid sample for introduction into a mass spectrometer, which comprises: introducing a sample of said solid deposited on the highly irregular surface of a conductive emitter into the ionization chamber of said mass spectrometer in close proximity to the ion exit port of the ionization chamber of said spectrometer; flowing a gaseous reactant capable of undergoing ionization to gaseous ions when subjected to high energy radiation through said ionization chamber; subjecting said flowing gaseous reactant to a high energy beam which ionizes the molecules of said gaseous reactant; and, simultaneously passing a heat generating current through said conductive emitter, thereby generating vaporized ions of said solid sample by exposure to the simultaneous influence of said gaseous ions and heat generating current for introduction into the analyzer section of said mass spectrometer.

4,175,235

APPARATUS FOR THE PLASMA TREATMENT OF SEMICONDUCTORS

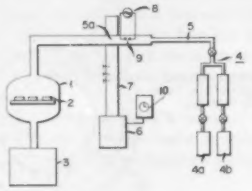
Kazuo Niwa, Yokohama; Masahiro Shibagaki, Hiratsuka, and Yasuhiro Horiike, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Aug. 29, 1977, Ser. No. 828,919

Claims priority, application Japan, Aug. 31, 1976, 51-103238

Int. Cl.[2] B28D *5/06;* **H05H** *1/24*

U.S. Cl. 250—542 **9 Claims**



1. Apparatus for the plasma etching of semiconductors comprising a plasma-generating section, means for introducing a gas suitable for plasma etching into said plasma-generating section, microwave discharging means for activating the gas contained in said plasma-generating section, an etching section in fluid communication with, and apart from, said plasma-generating section for etching semiconductor substrates with the activated gas, evacuation means for exhausting the gas from said etching section, and electric spark generating means positioned upstream of said plasma-generating section.

4,175,236

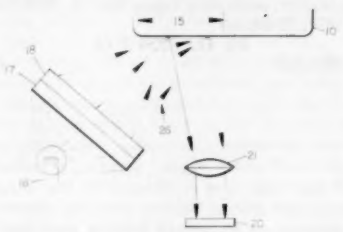
METHOD AND APPARATUS OF CAVITY IDENTIFICATION OF MOLD OF ORIGIN

Jonn W. Juvinall, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 23, 1977, Ser. No. 864,080

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—566 **20 Claims**



1. A system for identifying machine molded containers, wherein each container has

a specularly reflective bottom surface which includes a concentric ring code integrally molded into the bottom surface of said containers, comprising:

illuminating means for projecting light onto the bottom of said containers at an angle with the intensity of said light being a function of the angle at which the light makes with the general plane of the container bottom;

light sensing means for detecting light reflected from the container bottoms and the ring code;

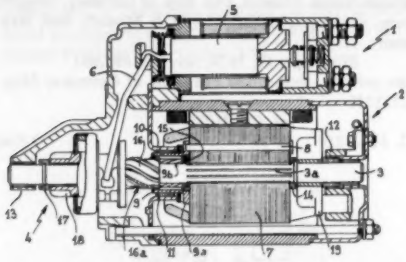
means for moving the containers relative to said illuminating means; and

code reading means connected to said sensing means for converting reflections from the bottom of the container into a code readout corresponding to the molded ring code of each container as it is moved past said illuminating means.

4,175,237
ELECTRIC STARTER FOR AN ENGINE

Alfred B. Mazzorana, 12, rue Fernand Léger, 69200 Venissieux, France

Filed Jun. 13, 1977, Ser. No. 806,249
Claims priority, application France, Jun. 22, 1976, 76 19543
Int. Cl.[2] F02N *11/00*
U.S. Cl. 290—38 R **6 Claims**

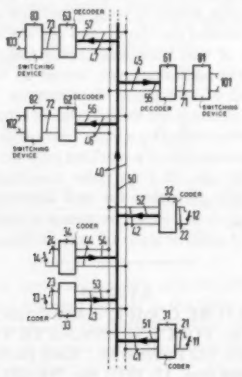


1. In an electric starter for an internal combustion engine having an electric motor with a rotating laminated armature on an armature shaft, and having a drive pinion mounted on the shaft with gear teeth on the pinion for engagement with a gear ring of the engine for rotation of the engine when driven by the motor, the improvement comprising a portion of said drive pinion extending toward said armature, the drive pinion and said portion being freely slidable and rotatable relative to the shaft and said portion having an annular splined surface, a drive sleeve fixed to one end of the laminated armature and having an annular splined surface surrounding the shaft in spaced relation thereto and arranged for interengagement with said splined drive pinion portion for direct rotational driving of the pinion from the laminated armature.

4,175,238
SWITCHING ARRANGEMENT FOR REMOTE-CONTROLLED ELECTRICAL LOADS

Fritz Breimesser, Erlangen; Christian Kuznia, and Karl-Ulrich Stein, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 727,240
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2543028
Int. Cl.[2] H02J *4/00*
U.S. Cl. 307—40 **52 Claims**

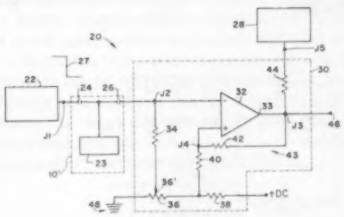


1. In a switching device for remote-controlled electrical load devices, which either individually or in groups can be selectively controlled by at least one command transmitter which produces an electric switching signal, from one or more than one position over at least one switching device which is connected by a low voltage, low current circuit composed of at least a supply and a return line to the command transmitter, and is connected by electric lines to at least one electrical load device, the combination of one coder disposed in the low voltage, low current circuit between each command transmitter and each switching device, which coder converts a switching signal produced by said command transmitter and transmitted to said coder over a first part of said low voltage, low current circuit in a coded signal, one decoder disposed in the low voltage, low current circuit between the coder and the switching device, and a separate transmission channel between said coder and said decoder over which the coded signal can be supplied to the decoder, with the latter converting the coded signal into a switching signal for actuating the switching device over a second part of said low voltage, low current circuit.

4,175,239
DETECTION MEANS FOR TOUCH CONTROL SWITCHES

Louis M. Sandler, North Reading, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Apr. 12, 1978, Ser. No. 895,755
Int. Cl.[2] H01H *35/00*
U.S. Cl. 307—116 **14 Claims**



1. In a touch control system of the type including at least one touch sensitive device which capacitively transmits a relatively large electrical signal when not touched and transmits a relatively small electrical signal when touched and means responsive to said electrical signal for detecting said touch and no-touch conditions of said touch sensitive device, the improvement wherein said detection means comprises: means for comparing voltages of said electrical signals to a predetermined reference voltage, said comparing means assuming at least two states indicative to touch and no-touch conditions of said touch sensitive device, and means responsive to said comparing means for controllably defining a time period for at least one of said states of said comparing means.

4,175,240
INTEGRATED LOGIC CIRCUIT WITH A CURRENT SOURCE MADE AS A FIELD-EFFECT TRANSISTOR

Vyacheslav Y. Kremlev, korpus 423, kv. 81; Artashes R. Nazarian, ploschad Junosti, 3, kv. 16; Alexei V. Lubashevsky, ploschad Junosti, 4, kv. 10, and Vilyam N. Kokin, korpus 441, kv. 115, all of Moscow, U.S.S.R.

Filed Jan. 3, 1978, Ser. No. 866,626
Claims priority, application U.S.S.R., Jan. 10, 1977, 2441813[I]; Jan. 10, 1977, 2441910
Int. Cl.[2] H03K *19/08, 19/34, 19/36, 19/40*
U.S. Cl. 307—205 **7 Claims**

1. An integrated logic circuit comprising:

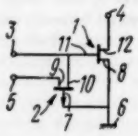
a first field-effect transistor operating in a switching mode and having a gate, a drain and a source;

a second field-effect transistor having its conductivity complementary to that of said first field-effect transistor, oper-

ating as a current source and having a gate, a drain and a source;

an input electrode coupled to the gate of said first transistor and to the drain of said second transistor;

an output electrode coupled to the drain of said first transistor;



a first power supply circuit electrode coupled to the source of said second field-effect transistor; and

a second power supply circuit electrode, which is grounded and coupled to the gate of said second transistor and to the source of said first transistor.

4,175,241

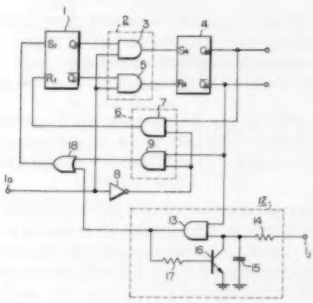
MASTER-SLAVE FLIP-FLOP CIRCUIT

Takao Tsuchiya, Fujisawa; Susumu Akazawa, Tokyo, and Kyoichi Murakami, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 764,045, Jan. 31, 1977, abandoned. This application May 24, 1978, Ser. No. 909,111

Int. Cl.[2] H03K *1/12*

U.S. Cl. 307—262 **9 Claims**



1. A master-slave, flip-flop circuit comprising:

a first input terminal to which a timing signal is applied;

a master flip-flop circuit having input terminals and output terminals;

a slave flip-flop circuit having input terminals and output terminals;

gating means for connecting said output terminals of said master flip-flop circuit to said input terminals of said slave-flip-flop circuit and for connecting said output terminals of said slave flip-flop circuit to said input terminals of said master flip-flop circuit;

said first input terminal being connected to said gating means to control the operation thereof with the assistance of output signals from said output terminals of said master flip-flop circuit and from said output terminals of said slave flop-flop circuit;

a gating circuit separate from said gating means and having a connection to one of said output terminals of said slave flip-flop circuit and connected to one of said input terminals of said master flip-flop circuit to assist in controlling the operation of said master flip-flop circuit; and

a second input terminal to receive signals to produce phase inversion of the output signals of said master-slave flip-flop circuit, said second input terminal being connected to said gating circuit to cooperate with said connection to said one output terminal of said slave flip-flop circuit in controlling the operation of said gating circuit to achieve controlled phase inversion of the signals at said output terminals of said slave flip-flop circuit.

4,175,242

CIRCUIT ARRANGEMENT FOR THE AUTOMATIC FREQUENCY CONTROL OF AN ULTRASONIC TRANSDUCER

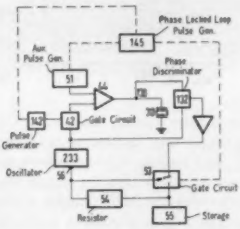
Peter Kleinschmidt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,901

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721225

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—316 **3 Claims**



1. Circuit arrangement for inducing resonance oscillations in an ultrasonic transducer which also has the property of generating an alternating current by mechanical excitation of oscillations in the transducer, which circuit comprises an oscillator for generation of an oscillator excitation AC-voltage, a first gate circuit for the pulse wise application of said oscillator AC-voltage to said transducer, said oscillator being frequency controllable, an auxiliary pulse generator being connected to said transducer and parallel to said oscillator and said first gate circuit, a phase discriminator connected to the input connection of said transducer, and to the output connections of said oscillator, an additional gate circuit between the output of said phase discriminator and a control input of said oscillator, a load circuit connected to the control input of said oscillator, a memory storage stage connected to said load circuit and to a second input of said additional gate circuit and a phase locked loop pulse generator which connects the pulse control with said auxiliary pulse generator, said first gate circuit and said additional gate circuit, and the pulse sequence of said phase locked loop pulse generator being such that in one cycle first a pulse is sent to said auxiliary pulse generator after a pause for the impulse generated oscillation and the automatic die-out of the oscillations of said transducer being followed by a pulse being sent to said additional gate circuit by which the phase compared signal of said phase discriminator by way of said additional gate circuit is fed to said control input of said oscillator, the cycle being ended by a pulse being sent to said first gate circuit to initiate transfer of a working pulse to said transducer, whereby, in the case of a no pulse condition of said phase locked loop pulse generator for said additional gate circuit, said storage stage is connected by means of said additional gate circuit with said control input of said oscillator.

4,175,243

TEMPERATURE COMPENSATED OSCILLATING CRYSTAL FORCE TRANSDUCER SYSTEMS

James P. Corbett, 923 Palermo Dr., Santa Barbara, Calif. 93105

Filed Nov. 17, 1977, Ser. No. 852,477

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—338 **9 Claims**

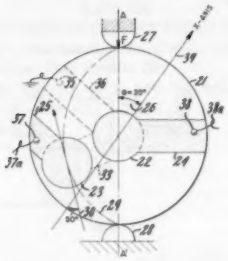
1. A force transducer comprising:

a plate-shaped piezo electric crystal having a peripheral edge,

at least two seating members engaging the peripheral edge of the crystal and arranged to apply force directed along a line extending through the plate-like crystal from one seating member to the opposing portion of the peripheral edge,

a first pair of electrodes disposed on corresponding regions on opposite sides of a first portion of the crystal,

a second pair of electrodes disposed on corresponding regions on opposite sides of a second portion of the crystal spaced from the first portion, and



means for energizing the electrode pairs to maintain oscillation of the first and second crystal portions at different frequencies,

the seating members and the first and second crystal portions being arranged with respect to the crystal axis so that the first crystal portion is relatively insensitive to changes in ambient temperature and highly sensitive to changes in force applied by the seating members and the second crystal portion is relatively insensitive to changes in force applied by the seating members and highly sensitive to changes in ambient temperature.

4,175,244

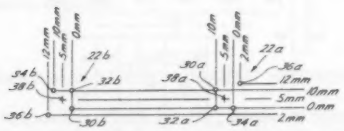
LAMP FILAMENT CONFIGURATION FOR USE IN A DRUM LENS

William R. Klein, and William V. Burns, both of Houston, Tex., assignors to Tideland Signal Corporation, Houston, Tex.

Filed Sep. 11, 1978, Ser. No. 940,939

Int. Cl.[2] K01K *1/14*

U.S. Cl. 313—315 **6 Claims**



1. In a lamp for use in a drum lens of a navigational light, the improvement in a filament system in the lamp comprising,

at least four vertically positioned similar filaments spaced about but away from a vertical axis adapted to be placed at the focal point of the lens,

said filaments positioned in a horizontal plane relative to each other whereby no more than two filaments are aligned in any horizontal direction.

4,175,245

MAGNETRON MAGNET ASSEMBLY

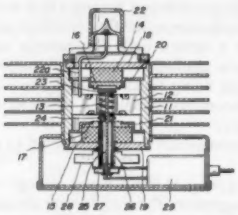
Yoshio Ishida; Masao Sakai; Mamoru Tsuzurahara; Ichiro Inamura, and Tomokatsu Oguro, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,585

Claims priority, application Japan, Jun. 24, 1977, 52/82501[U]

Int. Cl.[2] H01J *25/50*

U.S. Cl. 315—39.71 **7 Claims**



1. In a magnetron of the type comprising an anode cylinder, a pair of yokes mounted on the opposite ends of said anode cylinder, said anode cylinder and said yokes forming an evacuated envelope, a plurality of radial anode vanes secured to the inner wall of said anode cylinder to define an interaction space, a cathode electrode structure mounted in said interaction space, a holder located within said evacuated envelope and secured to the inner wall of said anode cylinder, a pole piece having a projection and a permanent magnet which are interposed between one of said yokes and said holder, the improvement wherein said holder is provided with an opening at the center thereof having a diameter smaller than the outer diameter of said projection and said projection is force-fitted in said opening to project into said interaction space.

4,175,246

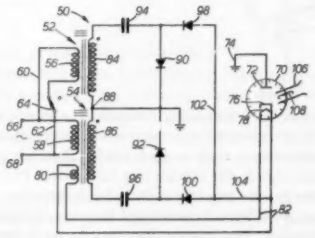
ENERGIZING CIRCUIT FOR MAGNETRON USING DUAL TRANSFORMER SECONDARIES

Albert E. Feinberg, and Kenneth Woo, both of Chicago, Ill., assignors to Advance Transformer Company, Chicago, Ill.

Filed Feb. 27, 1978, Ser. No. 881,626

Int. Cl.[2] H05B *39/00, 41/14*

U.S. Cl. 315—101 **16 Claims**



1. An operating circuit for energizing a magnetron from an a.c. line of relatively low voltage and frequency which comprises:

a. a magnetron having an anode and a cathode;

b. a generally constant current transformer and condenser means combination which includes

i. transformer means having primary winding means adapted to be connected to said a.c. line;

ii. said transformer means including two secondary windings each isolated from said primary winding means but coupled in high leakage reactance operating relation to

said primary winding means, the secondary windings each having a first terminal at opposite instantaneous polarity with respect to one another connected to a first common juncture which is and remains at ground potential during operation of the circuit; and

iii. each secondary winding having its second terminal connected through a respective charging condenser and blocking rectifier means to a common second juncture;

c. the anode and cathode of the magnetron being connected to the combination and to be subjected to the output voltage thereof;

d. each charging condenser having a first rectifier connected from the condenser to the first common juncture whereby to provide a return path for current on alternate half cycles of the applied voltage with respect to each condenser, there being formed thereby two loops each containing a secondary winding, a charging condenser and a first rectifier;

e. the magnetron anode being connected to the second juncture;

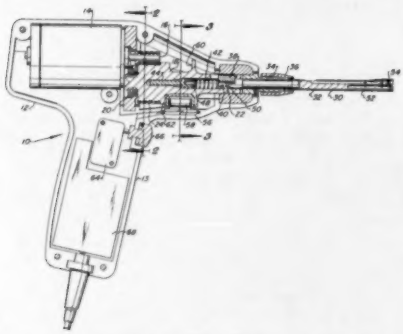
f. the circuit acting as a full wave voltage doubler to energize the magnetron, the transformer means and the charging condensers being chosen with such parameters that the current in each loop during operation is leading to provide good regulation of the magnetron current notwithstanding normal variations in the line voltage applied to said primary winding means.

4,175,247

ELECTRIC MOTOR CONTROL FOR CONDUCTOR WRAPPING TOOL

Robert W. Klemm, Hersey, Mich., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 26, 1978, Ser. No. 918,991
Int. Cl.[2] H02P *3/00*
U.S. Cl. 318—466 **9 Claims**



1. In a power tool including a housing, a rotary work performing member rotatably mounted in said housing, an electric motor drivably connected to said work performing member, and conductor means for connecting said motor to a source of electrical energy, the improvement which includes:

a motor control circuit connected to said conductor means and including first means for causing said motor to be operated at a first speed and a second speed less than said first speed;

a magnet mounted in said housing and operable to generate a magnetic field;

second means in said control circuit responsive to a change in the intensity of said magnetic field when said motor is operating at said second speed to cause said motor to be deenergized; and,

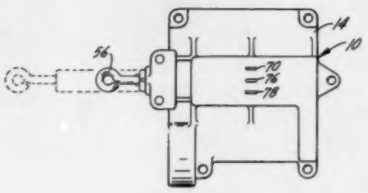
a member made of a magnetic material disposed to be rotated together with said work performing member and operable in a predetermined rotative position in proximity to said magnet to change the intensity of the magnetic field thereby causing said second means to deenergize said motor, said member further being responsive to a magnetic force acting thereon to bias said work performing member in said predetermined rotative position.

4,175,248

ELECTRIC POWER ACTUATOR

Dwight B. Whitfield, Bloomfield, Mich., and Kenneth K. Ferryman, Jr., Onalaska, Wis., assignors to Lake Center Industries, Winona, Minn.

Filed Jul. 18, 1977, Ser. No. 816,372
Int. Cl.[2] H02P *3/00*
U.S. Cl. 318—467 **1 Claim**



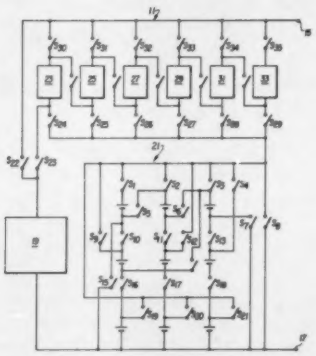
1. A linear actuator including a housing made up of two opposed housing halves, an electric motor mounted in one of the housing halves, a gear train positioned between the two housing halves and driven by the motor, a movable actuator member extending from the housing and driven by the gear train, electric bus bars mounted in the housing opposite the actuator member, a contact member driven by the actuator member and in electrical and mechanical contact with the bus bars, and an electrical connection between the bus bars and the electric motor so that the position of the contact member on the bus bars controls the flow of current to the motor.

4,175,249

SELF-RECONFIGURING SOLAR CELL SYSTEM

Robert P. Gruber, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 19, 1978, Ser. No. 916,655
Int. Cl.[2] H02J *7/34*; G05F *1/62*
U.S. Cl. 323—15 **7 Claims**



1. A self-reconfiguring solar cell system comprising:

an array of solar cells, the maximum power loading voltage V_L of each cell being a relatively constant fraction of the open circuit voltage V_{oc} of the cell for all ambient temper-

ature and illumination levels within practical usage bounds;

controllable switch means for interconnecting the solar cells in a plurality of series-parallel arrangements;

sensor means for determining the magnitude of V_{oc} for the ambient temperature and illumination level in use; and

means responsive to the determination of the magnitude of V_{oc} for controlling the switch means to interconnect the solar cells in a series-parallel arrangement to cause each cell in the array to operate at substantially the maximum power loading voltage V_L.

4,175,250

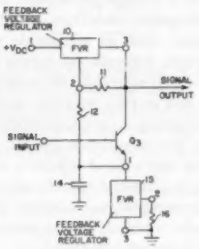
TRANSISTOR BIAS CIRCUIT

Denny E. Morgan, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 31, 1978, Ser. No. 892,100

Int. Cl.[2] G05F *1/56*

U.S. Cl. 323—22 T **5 Claims**



1. A circuit for providing a constant bias voltage and current for a transistor having a common electrode, an output electrode, and a control electrode adapted to receive a signal input, said circuit comprising

a source of direct current voltage,

two resistors in series between said common electrode and output electrode of said transistor, a first series resistor connected to said output electrode and a second series resistor connected to said common electrode of said transistor,

voltage regulating means connected to said source of direct current voltage for maintaining a predetermined voltage across said first resistor of said two resistors connected in series to the output electrode, thereby to produce a first constant current through said first resistor, and

means for providing a second constant current connected to said common electrode of said transistor, thereby to maintain a desired bias current through said transistor that is equal to the difference between said first and second constant currents while maintaining a constant bias voltage across the transistor from the output electrode to the common electrode.

4,175,251

NUCLEAR MAGNETISM LOGGING METHOD AND SYSTEM

Richard N. Chandler, Danbury, Conn., assignor to Schlumberger Technology Corporation

Filed Apr. 20, 1978, Ser. No. 898,275

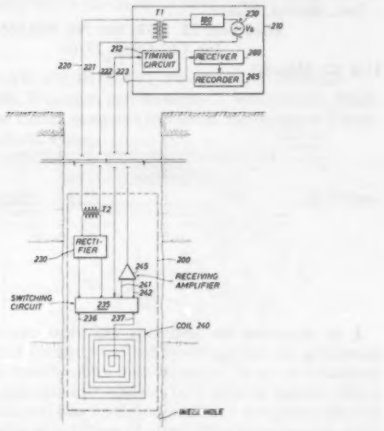
Int. Cl.[2] G01R *33/08*

U.S. Cl. 324—303 **12 Claims**

1. In a nuclear magnetism logging system, a method for applying a sequence of alternating current waveforms from a surface source of alternating current power to a load, each waveform in the sequence starting and stopping with substantially zero amplitude, the method comprising the steps of:

memorizing the starting and stopping polarity of the immediately preceding waveform in the sequence, and

starting and stopping the present waveform in the sequence of waveforms with polarities opposite to the recorded



starting and stopping polarities of said immediately preceding waveform in the sequence.

4,175,252

METER DRIVE CIRCUIT

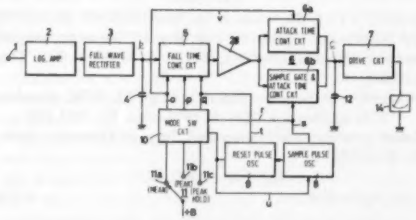
Hatsuhiko Shinoda, Komae, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 9, 1978, Ser. No. 884,814

Claims priority, application Japan, Mar. 12, 1977, 52-30274

Int. Cl.[2] G01R *19/16*; H03K *5/00*

U.S. Cl. 324—103 P **9 Claims**



1. A meter drive circuit comprising:

signal input means for supplying an input signal;

peak hold means for providing an output signal which represents the level of the peak value of the input signal occurring during a predetermined period, and for holding said output signal for the duration of such predetermined period;

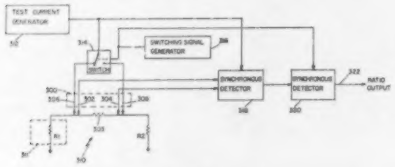
sample and hold means for sampling the level of said output signal from the peak hold means and for holding the sampled level of said output signal, said sample and hold means including a sampling gate circuit operative to pass said output signal from said peak hold means, a hold circuit connected to said sampling gate circuit for holding the output signal passed by said sample gate circuit, a sampling pulse oscillator to apply a sampling pulse to said sampling gate circuit for making the latter operative, and a reset pulse oscillator connected to said peak hold means for providing a reset pulse to reset said output signal after said sampling gate circuit is made operative; and

a signal level indicator connected to said sample and hold means for providing an indication of said sampled level which is being held in said sample and hold means.

4,175,253
ANALYZING ELECTRICAL CIRCUIT BOARDS

Alexander D. Pitegoff, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 22, 1978, Ser. No. 880,056
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—62 **7 Claims**



1. In apparatus for analyzing electrical circuit boards by measuring the voltage drop due test currents flowing along a conductor to an IC mounted on a circuit board, comprising a probe having at least two contact tips mounted to simultaneously contact at least two points on said conductor, said tips being spaced apart sufficiently to permit measurement of electrical activity in a segment of said conductor between said tips, and means for injecting a test signal directly into said conductor via said probe, that improvement comprising

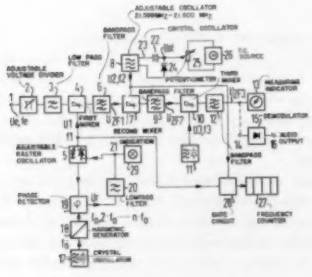
means for measuring a first voltage drop across a said segment produced by the flow of test current through said segment away from said IC and a second voltage drop across a said segment produced by the flow of test current through said segment into said IC, and

means for determining the ratio R_1/R_2, where R_1 is the internal resistance of said IC and R_2 is the parallel resistance of all other ICs on the same node.

4,175,254
SELECTIVELY TUNABLE HETERODYNE RECEIVER

Alfred Manfreda, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 666,182, Mar. 12, 1976, abandoned.
This application May 5, 1978, Ser. No. 903,255
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1975, 2511027
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—433 **6 Claims**

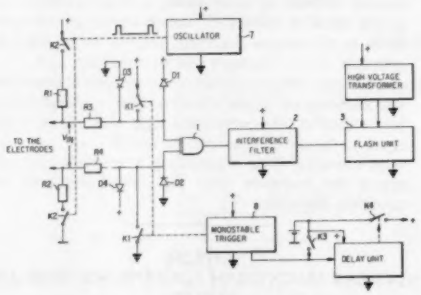


1. A tunable heterodyne receiver receiving an input signal and having at least two conversion stages which utilizes separate coarse and fine tuning and which can be set to a desired received frequency by first and second adjustable variable frequency signals including first and second mixers, a first adjustable injection oscillator developing said first signal which can be adjusted and locked to the harmonics of a fundamental frequency derived from a first crystal, said first mixer receiving said input signal and an input from said first injection oscillator to produce an output signal in a first intermediate frequency band, a second injection oscillator having a frequency determining circuit and developing said second signal which is continuously adjustable within a frequency range corresponding to the frequency spacing between adjacent harmonics of said first crystal, a second crystal in said frequency determining circuit for stabilizing its frequency to a stable frequency, an adjustment means connected to said second crystal oscillator for shifting its stable frequency over a continuously adjustable range which is very small in comparison to its nominal frequency, the frequency spacing between adjacent harmonics of the output of said first crystal oscillator fundamental frequency which control said first injection oscillator selected to be small enough that such spacing does not exceed the width of the adjustment range of said stable frequency of said second crystal oscillator, said second mixer receiving said first mixer output signal and said second variable frequency signal and a frequency counting means deriving the selected received frequency from the frequencies of said first and second injection oscillators, and wherein said adjustment means consists of a voltage controlled capacitive diode connected in the frequency-determining circuit of said second injection oscillator, and an adjustable voltage source connected to said diode, wherein the output of said second mixer comprises a second intermediate frequency band, the output of one of said first and second injection oscillators is supplied to said frequency counting means, said frequency counting means including a gate circuit which is opened by a signal from the other of said first and second injection oscillators whereby a counted output is obtained which corresponds to the frequency of the input signal and wherein said frequency counting means includes a preadjusted counter enabling indication of said selected received frequency.

4,175,255
DEVICE TO PROTECT AGAINST FLOW OF CURRENT

Sven N. J. Linnman, Gottsundav. 13, S18400 Åkersberga; Peter Isoz, Åda Gård, 15014 Vagnhärad; Nils P. Branderud, Båtholmsb. 21nb, S 12742 Skärholmen, and Per E. C. Udden, Box 90, S86100 Timrå, all of Sweden

Filed Sep. 6, 1977, Ser. No. 831,007
Int. Cl.[2] A61N *1/36;* G08B *21/00;* H05F *1/00*
U.S. Cl. 328—7 **5 Claims**



1. A protective device to interrupt the flow of current at a work place when current of a magnitude to endanger life flows through the body of a user comprising:

at least two electrodes with skin contact for application to the body of a user;

a voltage sensor connected to the electrodes for determining the voltage difference between the electrodes when a current flows through the body of the user and generating a signal when the voltage difference exceeds a given limit value;

a circuit breaking device spaced from the voltage sensor and

responsive to the signal for interrupting the flow of current; and

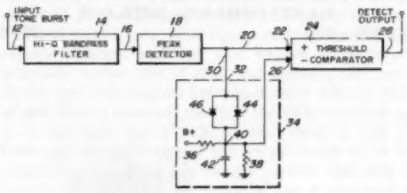
a test oscillator for emitting intermittent voltage impulses through the electrodes to the body of the user.

4,175,256

DYNAMIC THRESHOLD TONE DETECTOR

Arman V. Dolikian, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 30, 1976, Ser. No. 710,766
Int. Cl.[2] H03K *5/20*
U.S. Cl. 328—149 **7 Claims**



1. Apparatus for detecting the presence of a tone having a frequency f in a received signal comprising:

filter means including tuning circuitry tuned to the frequency f for processing the received signal and passing only those signals having a frequency at or near the frequency f;

detector means, responsive to the filter means, for producing a detecting signal representative of the magnitude of the filter means passed signals, the detect signal being at or near a reference level in response to the absence of a significant filter means passed signal;

comparator means having first and second inputs and an output, the output assuming a first logic state responsive to the signal received at its first input being less than the signal received at its second input, the comparator means output otherwise assuming a second logic state;

means for coupling the detect signal to the comparator means first input;

means for producing a dynamic threshold signal and applying the same to the comparator means second input, the dynamic threshold signal of predetermined magnitude such that when the detect signal is at or near the reference level the comparator output assumes the first state and that for a predetermined incremental increase in the detect signal the comparator means output assumes the second state, the threshold detect signal tracking further increases in the detect signal and lagging by an incremental amount such that for a predetermined incremental decrease in the detect signal the comparator means output assumes its first state,

whereby the comparator output assuming the first state is representative of the undetect condition and the comparator output assuming the second state is representative of the detect condition; said means for producing a dynamic threshold signal comprises:

a bias supply having an output potential terminal and a reference potential terminal;

a resistive voltage divider connected between the output and reference potential terminals of the bias supply, the divider having an output tap for supplying a predeterminedly divided portion of the bias supply;

capacitor means coupled between the voltage divider tap and reference potential for tending to maintain the voltage thereacross;

means for coupling the resistive divider tap to the second input of the comparator means; and

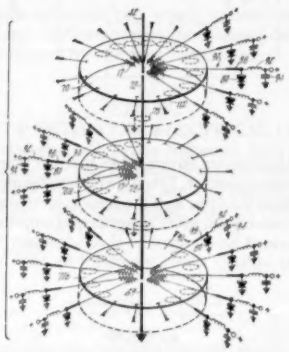
clamping means coupling between the detector means and the resistive divider for clamping the voltage at the tap of the divider to an incremental value above the reference terminal responsive to the detect signal being less than the predetermined lower level, the clamping means clamping the voltage at the tape of the divider to an incremental value below the output terminal responsive to the detect signal being above the predetermined upper level.

4,175,257

MODULAR MICROWAVE POWER COMBINER

Peter W. Smith, Westport, and Rudolph G. Mastrioanni, Stratford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 5, 1977, Ser. No. 839,727
Int. Cl.[2] H03F *3/60*
U.S. Cl. 330—287 **22 Claims**



1. A power combiner for microwave energy, comprising:

a housing having at least one internal cavity disposed therein defined by a pair of facing end surfaces, said internal cavity being sized to resonate at a single frequency;

diode means situated within said housing for providing a source of microwave energy;

diode waveguide means positioned to extend radially within said housing, and having a coupling point situated axially adjacent one end surface defining said internal cavity, for electrically coupling said diode means to said internal cavity;

aperture means disposed through one of said end surfaces defining said internal cavity, near the periphery thereof, and situated in axial alignment with said coupling point of said radial waveguide means for forming an opening to said internal cavity through which microwave energy can propagate;

output means including an axially extending waveguide through one of said end surfaces defining said internal cavity for propagating microwave energy out of said power combiner; and

means including an axially extending waveguide through the other one of said end surfaces for reflecting microwave energy back into said cavity.

4,175,258

HIGH LEVEL WHITE NOISE GENERATOR

Casimer J. Borkowski, Oak Ridge, and Theron V. Blalock, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1978, Ser. No. 929,145
Int. Cl.[2] H03B *29/00*
U.S. Cl. 331—78 **7 Claims**

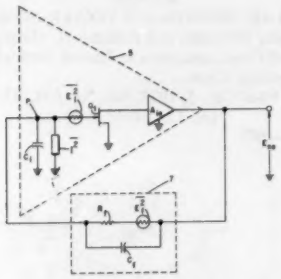
1. A high-level, white noise generator, comprising:

an inverting amplifier having an output from which said white noise signal is available; and

a thermal noise voltage signal generating feedback network connected between the output and the input of said ampli-

fier including a series resistor means (R_f) for generating said thermal noise voltage signal in accordance with the following equation:

$$E_n^2 = 4KT_fR_f\Delta f.$$



wherein E_n^2 is the open circuit RMS thermal noise voltage, K is the Boltzmann constant, T_f is the absolute temperature of the resistance (R_f) in Kelvins, R_f is the feedback resistance in ohms, and Δf is the noise bandwidth in hertz, said amplifier having an internal generated noise signal level substantially less than said thermal noise voltage signal generated by said feedback network.

4,175,259

CONSTRUCTION OF PRESET PLATE FOR VHF TUNER

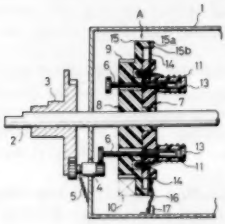
Tasuku Noji, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,161

Claims priority, application Japan, Dec. 17, 1976, 51/169081[U]

Int. Cl.[2] **H03J** *5/02, 1/00;* **H01H** *19/58*

U.S. Cl. 334—49 **4 Claims**



1. In a preset plate for a VHF tuner, including a first rotary body and a second rotary body each adapted to be mounted on a shaft for rotation therewith, said first rotary body carrying a plurality of inductance coils each corresponding to a respective channel of the tuner and said second rotary body carrying a plurality of screws each aligned with a respective inductance coil and adapted to be positioned within its respective coil to vary the inductance thereof for providing a fine tuning of the selected channel, and means for switching between inductance coils, said switching means including contact pieces connected electrically to respective coils and carried by said first rotary body for rotation into engagement with contact portions of at least one fixed contact member; the improvement comprising said contact pieces each being embedded within said first rotary body and extending radially outwards therefrom to a free end portion, said second rotary body having an outer portion spaced radially outwards from said first rotary body, said outer portion having recessed seat portions and projecting portions between adjacent seat portions, said free end portions each lying against a respective seat portion whereby during rotation of said first and second rotary body members, said projecting portions will lift each said contact member by a camming action to disengage the contact portion thereof from said contact pieces and said first rotary body, and return each said contact portions to said contact pieces with little bounce therebetween.

4,175,260

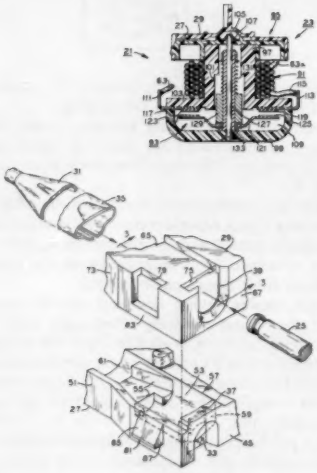
RELAY DEVICE, METHODS OF ASSEMBLING AND MOUNTING, AND SYSTEM

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 22, 1977, Ser. No. 809,054

Int. Cl.[2] **H01H** *9/02;* **H02B** *1/08*

U.S. Cl. 335—202 **25 Claims**



1. A relay device adapted to be removably mounted in plug-on circuit relation with a pair of male terminals of an electrically energized apparatus, the relay device comprising:

a housing having receptacle means adjacent an end thereof for the releasable mounting in the plug-on circuit relation with the male terminals;

coil means associated with said housing and adapted for electrical energization;

switch means in said housing including a first pair of contact means, a second pair of contact means movable between making and breaking positions with respect to said first contact means pair, and armature means disposed in magnetic coupling relation with said coil means and associated with said second contact means pair for moving them from one of the making and breaking positions to the other thereof upon the energization of said coil means;

a pair of female terminals for respectively receiving in electrical contacting engagement the male terminals;

a first lead associated with said coil means and electrically connected with one of said female terminals;

a second lead electrically connected between the other of said female terminals and one of said contact means of said first contact means pair;

said receptacle means including a flange portion and a cover portion separable therefrom and arranged so as to be

releasably engaged with said flange portion in a predetermined assembled position;

said flange portion including a pair of opposite surfaces interconnected between a plurality of side surfaces, a pair of cavities in one of said opposite surfaces and in which said female terminal pair is respectively seated, a pair of passage means in said one opposite surface and associated with said cavity pair for receiving said first and second leads, respectively, a first pair of openings respectively intersecting with one of said side surfaces of said side surface plurality and connected with said cavity pair for accommodating the passage of the male terminal pair into the electrical contacting engagement with said female terminal pair when said receptacle means is removably mounted in the plug-on circuit relation with the male terminal pair, a pair of bridging means disposed at least closely adjacent said one side surface so as to extend generally across one of said first opening pair and said cavity pair and adapted for engagement with at least one of said female terminal pair and the male terminal pair so as to generally prevent the displacement of said flange from said female terminal pair in the event of at least a partial separation of said flange portion and said cover portion when said female terminal pair is disposed in the electrical contacting engagement with the male terminal pair; and

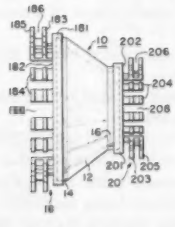
said cover portion including a cover wall interconnected between a plurality of sidewalls depending therefrom, said cover wall being disposed generally in overlaying relation with said one opposite surface of said flange portion and at least some of said sidewalls of said sidewall plurality being disposed at least in part in opposed confronting relation with at least some of said side surfaces of said side surface plurality on said flange portion so as to generally capture said female terminal pair in said cavity pair with at least part of said first and second leads enclosed within said passage means pair when said cover portion is releasably engaged in the predetermined assembled position with said flange portion, and a second pair of openings in one of said sidewalls of said sidewall plurality disposed in the overlaying relation with said one side surface of said flange portion when said cover portion and said flange portion are releasably engaged with each other in the predetermined assembled position and arranged generally in alignment with said first opening pair for accommodating the passage of the male terminal pair into the electrical contacting engagement with said female terminal pair when said receptacle means is removably mounted in the plug-on circuit relation with the male terminal pair.

4,175,261

DEFLECTION YOKE

Eiji Sawada, Tokyo, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1977, Ser. No. 865,233
Claims priority, application Japan, Dec. 28, 1976, 51-160557
Int. Cl.² H01F *7/00*
U.S. Cl. 335—210 **3 Claims**



1. A deflection yoke comprising:

a coil frame including a flared body and first and second guide members provided at the front and rear ends of the flared body, each guide member including a ring-shaped attachment portion and a plurality of pairs of circumferentially arrayed finger members displaced from said attachment portion and extending radially with respect to said attachment portion and circumferentially spaced from one another wherein slots are formed between adjacent pairs of said finger members and grooves are formed by the finger members of each pair, all of said grooves being aligned to form a circumferential annular groove;

a toroidal-type deflection coil wound on said coil frame in a toroidal configuration between corresponding ones of said slots formed between the finger members of said guide members; and

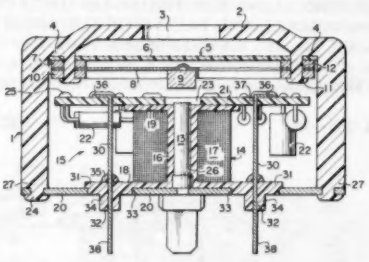
a saddle-type deflection coil wound on said coil frame in a saddle-type configuration in the annular circumferential grooves formed by said finger members.

4,175,262

BUZZER WITH RIGID ELECTRICAL LEADS

Mototaka Harakawa, and Yoshio Mitumori, both of Shizuoka, Japan, assignors to Star Seimitsu Kabushiki Kaisha, Japan

Filed May 17, 1978, Ser. No. 906,912
Claims priority, application Japan, May 17, 1977, 52-56627
Int. Cl.² G10K *9/12, 1/00*
U.S. Cl. 340—388 **16 Claims**



1. A buzzer with rigid electrical leads comprising a housing, a vibrator unit including a diaphragm which is supported by the housing, and a drive unit including a coil assembly which electromagnetically excites the vibrator unit, the coil assembly including a bobbin of a non-magnetic and non-conductive material and having a pair of flanges at its opposite axial ends, and a winding on the bobbin, the drive unit including a plurality of rigid electrical leads which project externally of the housing, and electrical circuit means for connecting the leads with the winding, at least one of the flanges having guide means which support the leads, said electrical leads serving to connect the winding electrically with an external electrical circuit and to mount the buzzer on an external mounting structure.

4,175,263

TECHNIQUE FOR MONITORING WHETHER AN INDIVIDUAL IS MOVING FROM A PARTICULAR AREA

William C. Triplett, Ingleside, and Richard B. A. Morrow, Corpus Christi, both of Tex., assignors to Triad & Associates, Inc., Robstown, Tex.

Filed Apr. 25, 1977, Ser. No. 790,814
Int. Cl.² G08B *21/00*
U.S. Cl. 340—573 **19 Claims**

1. A monitoring system for determining and indicating when an individual is moving from a given location, comprising

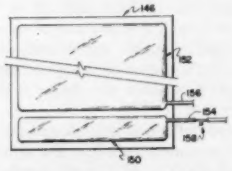
a pressure sensing pad for receiving part of the individual's weight, the pad including a layer of compressible permeable material for receiving a fluid therein, an envelope impermeable to the fluid and enclosing the material and a

conduit extending through the envelope in communication with fluid in the material; and

means for indicating when the individual is moving from the given location including

an alarm, and

means in circuit with the alarm for energizing the same including a pressure differential switch having a first



pressure compartment, an inlet to the first compartment connected to the conduit, a second compartment, a first switch contact in one of the compartments, a second switch contact, and means separating the first and second compartments and movable in response to pressure differentials between the first and second compartments in switch contact opening and closing directions.

4,175,264

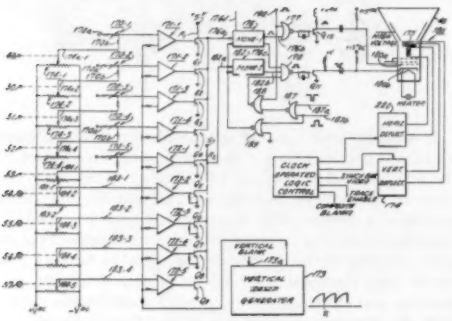
ELECTRONIC SYNCHRONIZER-MONITOR SYSTEM FOR CONTROLLING THE TIMING OF MECHANICAL ASSISTANCE AND PACING OF THE HEART

Peter Schiff, Box 117, Schwenksville, Pa. 19473

Division of Ser. No. 556,153, Mar. 6, 1975, Pat. No. 4,016,871. This application Jan. 17, 1977, Ser. No. 759,874

Int. Cl.[2] **G06K** *15/20*

U.S. Cl. 340—747 **17 Claims**



1. Display means for displaying at least two signals as traces on a display which contrast with one another to enhance the viewing thereof comprising:

a cathode ray tube (CRT) having a display face, an electron beam generating means, a control grid and a cathode and first and second deflection means for deflecting an electron beam generated by said electron beam generating means;

first and second ramp generating means for generating ramp signals and being respectively coupled to said first and second deflection means;

clock means for resetting said first ramp generating means at a first predetermined rate;

divider means coupled to said clock means for resetting said second ramp generating means at a second predetermined rate which is 1/nth said first rate;

a plurality of comparator means at least equal in number to the number of signal traces adapted to be simultaneously displayed on said tube face, said comparator means having first and second inputs and an output for generating a signal when the signals at said first and second inputs are substantially equal;

third ramp generating means operated by said clock means in synchronism with said first ramp generating means and being coupled to one input of each of said comparators;

summing circuit means having first and second inputs and an output coupled to the remaining input of its associated comparator means;

each signal to be displayed being coupled to one input of an associated one of said summing circuit means;

adjustable signal level means for coupling an adjustable d.c. level to the second input of each of said summing circuit means whereby the signal at said first input controls the size and shape of said trace and wherein the d.c. level at said second input controls the position of the trace on the display face;

means coupled between each of said comparator means and said cathode and control grid of said CRT and responsive to said signal at the output of said comparator means to render said control grid sufficiently positive relative to said cathode to unblank the CRT electron beam.

4,175,265

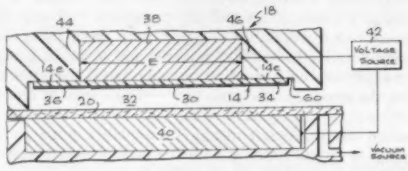
TONER TRANSFER SYSTEM

Alfred M. Nelson, Redondo Beach, and David L. Davis, Venice, both of Calif., assignors to AM International, Inc., Los Angeles, Calif.

Filed Oct. 28, 1976, Ser. No. 736,310

Int. Cl.[2] **G03G** *19/00*

U.S. Cl. 346—74.1 **9 Claims**



1. In a printing system which includes a tape transport for moving a tape which has a layer of dielectric material and which has front and rear faces, with the front face carrying toner that forms images thereon, along a predetermined tape path, a print medium transport for moving paper or other print medium along a predetermined print medium path that passes adjacent to said tape path, so that the front of the tape faces the front of the print medium, and a transfer station located at the region where said print medium path moves the adjacent to said tape path, the improvement of a toner transfer apparatus comprising:

a transfer electrode located behind said tape path, at said transfer station,

a reference electrode located behind said print medium path at said transfer station;

a voltage source coupled to said electrodes, for applying a voltage between said electrodes that causes the toner on said tape to transfer from said tape to said print medium;

said transfer electrode being narrower than said tape; and

a pair of insulator portions located on either side of said transfer electrode and behind opposite side portions of said tape, whereby to prevent arcing when a high voltage is applied.

4,175,266

GROOVED DEFLECTION ELECTRODES IN AN INK JET SYSTEM PRINTER

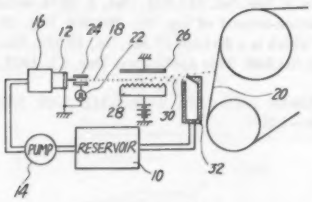
Ichizo Nakano, Tokyo; Rikuo Takano, Musashino; Tamaki Saito, Koganei; Yuji Sumitomo, Nara; Toshio Kobayashi, Osaka, and Yoichi Yamamoto, Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed May 7, 1976, Ser. No. 684,363

Claims priority, application Japan, May 13, 1975, 50-57860

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **12 Claims**



1. In combination with an ink jet system printer which emits charged ink droplets from a nozzle toward a recording paper in a path of travel and selectively deflects said ink droplets by deflection means and records desired symbols on said recording paper with said selectively deflected ink droplets, said droplets on impact with said recording paper emitting ink mist which rebounds toward said deflection means and tends to accumulate thereon, said deflection means comprising:

a pair of deflection electrodes having opposed surfaces;

a high-voltage source to establish a high-voltage electric field between the pair of deflection electrodes; and

groove means defined in the surface of at least one of said electrodes transversely of said path of travel for constraining ink mist impinged thereon to collect in said groove means away from said surface to preclude disturbance of said electric field by accumulations of ink.

4,175,267

METHOD AND APPARATUS OF INSERTING AN ADDRESS SIGNAL IN A VIDEO SIGNAL

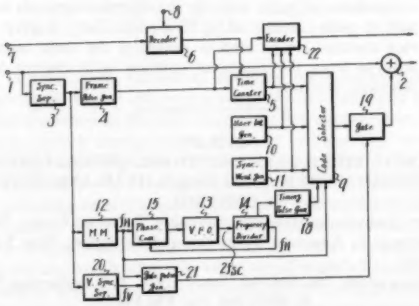
Katsuichi Tachi, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 819,172, Jul. 26, 1977, Pat. No. 4,134,130. This application Jun. 28, 1978, Ser. No. 919,937

Claims priority, application Japan, Jul. 30, 1976, 51-91551; Jul. 30, 1976, 51-91878; Jul. 30, 1976, 51-91879

Int. Cl.[2] H04N *5/76*

U.S. Cl. 358—4 **6 Claims**



3. An apparatus for producing a video signal having a chrominance subcarrier having a frequency equal to 455/2 of the horizontal line frequency with an address signal therein, comprising:

(a) means for providing the address code corresponding to one field or frame of the video signal, said address code consisting of a plurality of time code bits,

(b) means for converting said address code into an address signal having a shorter duration than one horizontal line of said video signal,

a bit frequency of said address signal being selected at (1/N) of said subcarrier frequency, wherein N is an integer more than one,

(c) means for selecting at least one predetermined horizontal line within a vertical blanking period of each field or frame of said video signal, and

(d) means for inserting said address signal in said selected one horizontal line.

6. Apparatus according to claim **3** including means for recording on a magnetic tape in slant tracks, said video signal including said address code, means for detecting the video signal and address code, a plurality of memories to which successive address code signals are applied and stored, comparing means connected to said plurality of memories and determining when all or a predetermined number of stored address signals correlate, and output means receiving the output of said comparing means.

4,175,268

SOLID STATE COLOR CAMERA

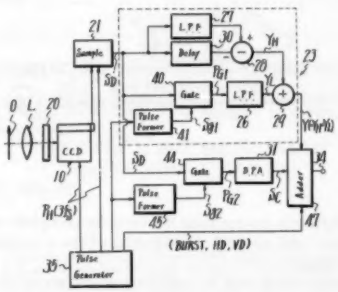
Shigeyuki Ochi, Machida; Hiroshi Yamazaki, Ebina, and Seisuke Yamanaka, Mitaka, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,902

Claims priority, application Japan, Nov. 26, 1976, 51-142493

Int. Cl.[2] H04N *9/04*

U.S. Cl. 358—44 **10 Claims**



1. A solid state color camera comprising:

(a) an image sensor having a plurality of image sensing elements aligned both in the horizontal and vertical directions;

(b) a vertical shift register having a storage register for storing image informations sensed by said image sensing elements and a transfer register for transferring said image information from said image sensing elements to said storage register;

(c) an output register connected to said vertical shift register for reading out said image informations stored in said vertical shift register;

(d) an output terminal to which the color image signal from said output register is supplied;

(e) filter means covering said image sensing elements, said filter means having a predetermined light separation characteristic through which said image sensing elements sense the predetermined limited color image informations;

(f) electrode means for picking up said color informations from said image sensing elements and for transferring said

color informations to said output register, said electrode means having a first group electrodes which correspond to said image sensing elements and a second group of electrodes which corresponds to said vertical shift register;

(g) a clock pulse source connected to said electrode means, said source providing sensor clock pulse and vertical shift clock pulse for driving said image sensing elements and said vertical shift register by the correlated timing phase thereof in which the timing phase of said clock pulses are so arranged that an interlace scanning order and a predetermined color sub-carrier phase order of the output signal informations at the output of said vertical shift register are satisfied as like the order of a standard color television signal; and

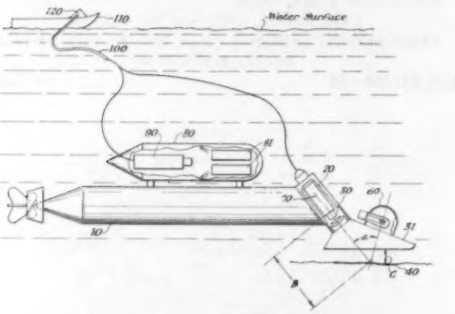
(h) means for supplying a clock carrier signal to said output register by which the transferred color image informations from said vertical shift register are read out due to the carrier signal frequency, said carrier signal being selected that the output signal at said output terminal has a predetermined color sub-carrier frequency equal to that of said standard color television signal.

4,175,269

UNDERWATER TV SURVEILLANCE OF PIPELINES

Dimetri Rebikoff, 102 R.D. E. Gazagnaire 06400, Cannes, France

Filed May 15, 1974, Ser. No. 470,226
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—99 **5 Claims**



5. An underwater device used for viewing complete images in turbid water and making photographs of the complete images, comprising:

a body positionable near an underwater surface of the subject matter to be viewed,

an underwater electromagnetic wave source directing the wave energy from said source toward the surface of the subject matter being viewed,

a camera connected to said body, said camera positioned such that said wave energy from said wave source which strikes the surface of the subject being viewed is reflected at a reflected angle from the surface of the subject into said camera,

said camera having a center line viewing axis,

said wave source having a general center line wave axis, said wave source and said camera positioned relative to one another with said reflected angle between said viewing axis and said wave axis being greater than 30 degrees and less than 90 degrees to reduce the viewable area on particles positioned between said wave source and said camera,

said camera includes a camera lense connected to said camera and at least one underwater corrected lense having one side connected adjacent to said camera lense and a second surface facing the surface of the subject matter, and

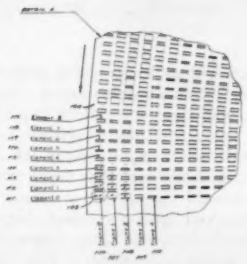
said body includes a block of material having a forward viewing surface, sides, and another surface connected adjacent to said second surface of said corrected lense, said block of material having said camera and said wave source mounted thereupon such that the wave energy from said wave source passes through said block of material to strike the surface of the subject being viewed and is reflected from the surface of the subject through said block of material into said camera.

4,175,270

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING VIDEO

George E. Zenzefilis, 27 Los Vientos, Camarillo, Calif. 93010

Division of Ser. No. 511,932, Oct. 3, 1974, which is a continuation-in-part of Ser. No. 289,989, Sep. 18, 1972, abandoned, which is a division of Ser. No. 23,289, Mar. 27, 1970, Pat. No. 3,701,846. This application Dec. 12, 1977, Ser. No. 859,742
Int. Cl.[2] H04N *5/76, 5/84, 9/02;* **G11B** *5/09, 5/012, 5/82*
U.S. Cl. 358—128 **18 Claims**



1. A device having video information stored thereon for reproduction by means of an associated transducer during relative movement between the transducer and the device comprising:

a plurality of discrete information storage segments located over the surface of said device, each segment representing the condition of a corresponding element of a video display device associated with said transducer for reproducing the stored information in a succession of video frames, each frame being formed of scan lines;

said discrete segments being arrayed for traversal during movement of the transducer relative to the device along a succession of generally circumferential paths while the transducer progresses in a direction of relative movement substantially orthogonal to the circumferential path direction, each circumferential path of discrete segments representing a video frame; and

said discrete segments being arrayed in a plurality of rows generally aligned orthogonally to the direction of the circumferential paths wherein the discrete segments from path to path corresponding to a particularly display device element are located at generally the same angular position from the center of rotation with respect to a reference position.

4,175,271

HELICAL VIDEO TAPE INSERT RECORDING EDITING METHOD WITH FLYING ERASE HEAD AND SERVO CONTROL

Harry Kaemmerer, Franklin Township, Somerset Couty, N.J., assignor to American Telephone and Telegraph, New York, N.Y.

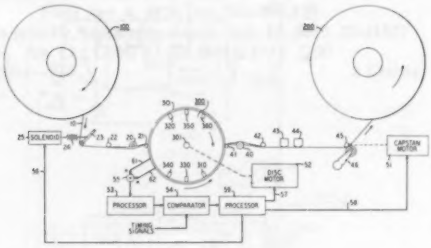
Division of Ser. No. 646,063, Jan. 2, 1976. This application Sep. 6, 1977, Ser. No. 830,596
Int. Cl.[2] H04N *5/795;* **G11B** *27/08, 15/52*
U.S. Cl. 360—14 **5 Claims**

1. A method for controlling tape tension and relative speed

during recording editing of a prerecorded video tape on a helical video tape recorder employing a flying erase head and having means for tape tension and relative speed control and including a standard timing signal source, comprising the steps of:

placing said helical video tape recorder into an insert recording editing mode:

detecting horizontal synchronization signals embedded in



the diagonal tracks on said prerecorded video tape prior to flying erasure of video information to be replaced;

comparing said embedded synchronization signals with timing signals from said standard source to develop an error signal proportional to the timing difference therebetween; and

controlling responsive to said error signal the tape tension and relative speed of said helical video tape recorder so as to diminish said error signal.

4,175,272

VIDEO SIGNAL PROCESSING CIRCUITRY FOR COMPENSATING DIFFERENT AVERAGE LEVELS

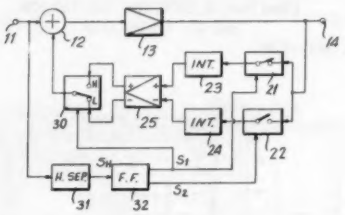
Toshihiko Numakura, Kamakura, and Jun Hirai, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1978, Ser. No. 937,095

Claims priority, application Japan, Aug. 30, 1977, 52-103999

Int. Cl.[2] **H04N** *5/84, 5/14*

U.S. Cl. 360—34 **9 Claims**



1. Video signal processing circuitry for compensating a video signal having different average levels in alternate horizontal line intervals thereof, comprising first average detecting means operable during alternate ones of said line intervals for detecting the average level of the video signal in said alternate line intervals; second average detecting means operable during the remaining ones of said line intervals for detecting the average level of the video signal in said remaining line intervals; compensating means responsive to the difference between said detected average levels of the video signal in said alternate and remaining line intervals, respectively, for producing compensating signals; and combining means for combining said compensating signals with said video signal so as to minimize the difference between the average level of the video signal in successive line intervals.

4,175,273

APPARATUS FOR AUTOMATICALLY STOPPING A CASSETTE TAPE RECORDER

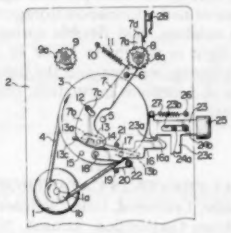
Toshiaki Nakamura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1978, Ser. No. 916,796

Claims priority, application Japan, Jul. 5, 1977, 52/88822[U]

Int. Cl.[2] **G11B** *15/22;* **B65H** *59/38, 63/02*

U.S. Cl. 360—74.3 **11 Claims**



1. Apparatus for automatically stopping a tape recorder, comprising feed means for feeding recording tape in response to the rotation of said feed means, motive means for rotating said feed means at a speed which is dependent upon the speed of said motive means, stop means employing the inertial energy of said feed means when said feed means is rotating for automatically deenergizing said motive means and thus stopping the rotation of said feed means when the end of a fed tape is reached, accelerator means for increasing the speed of said motive means so as to increase the speed and therefore the inertial energy of said feed means, whereby the operation of said stop means is enhanced, and actuator means for automatically actuating said accelerator means as the end of a fed tape is reached.

4,175,274

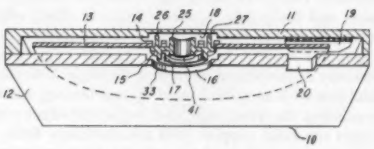
RECORDING SYSTEM WITH FLEXIBLE MAGNETIC RECORDING DISC

Don C. Mann, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1977, Ser. No. 848,182

Int. Cl.[2] **G11B** *17/04, 23/02*

U.S. Cl. 360—99 **12 Claims**



1. A system for recording and/or reading information on a recording surface of a sheet of flexible information storage media, said system comprising:

(a) a sheet of flexible information storage media having first and second opposite major surfaces, said first major surface for recording information thereon;

(b) a cartridge containing said information storage media, said cartridge having:

(i) a first relatively flat surface with an opening for receiving a recording and/or playback head therethrough, said flat surface being in facing relationship to the first major surface of said information storage media, and

(ii) a second relatively flat surface opposite said first relatively flat surface, said second relatively flat surface being in facing relationship to said second major surface;

(c) means for rotating said information storage media so that

the rotational motion of said information storage media causes said information storage media to rise above said first relatively flat surface, creating an air cushion between said first major surface and said first relatively flat surface, said recording and/or playback head writing and reading information on said first major surface while said media is in rotation; and

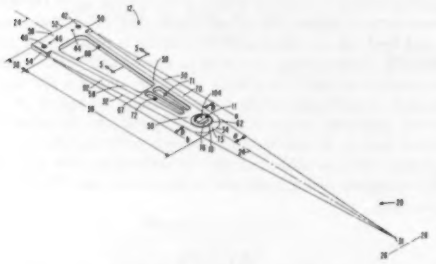
(d) a flexible spring member affixed to said second relatively flat surface opposite the recording and/or playback head receiving opening in said first relatively flat surface for providing a bias by air back pressure against the second major surface of said information storage media when said media is in rotation, said flexible spring member being sufficiently light in weight to allow an air film to form between the spring member and the information storage media when said media is in rotation, thereby preventing wear and drag.

4,175,275

R/W ARM THAT PREVENTS CATASTROPHIC FAILURE

Donald W. Schaefer, Lakewood, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1978, Ser. No. 908,490
Int. Cl.[2] G11B *5/54*
U.S. Cl. 360—104 **4 Claims**



1. In a disk storage file including a plurality of flexible disks mounted for rotation about a central axis and a positioning mechanism which positions a transducer into a pack opening along a radial line transverse to circumferential data tracks to read and/or write data formed in the data tracks on a surface of the flexible disks, an improved head support arm for the transducer comprising, in combination, a relatively thin and planar member elongated along said radial line having a closed, continuous and uniformly tapered relatively sharp edge contour formed about a majority portion of its periphery including a front edge, a leading edge and a trailing edge which are symmetrically disposed and inclined at an angle with respect to said radial line with an apex formed by said leading and trailing edges preceding the front edge, said angle and edges cooperating to eject the head support arm automatically from within the magnetic disk pack in the event the pack opening in the flexible rotating disks dissipates.

4,175,276

TRANSFORMER INRUSH CURRENT DETECTOR

Russell M. Smith, North East, Pa., assignor to General Electric Company, Erie, Pa.

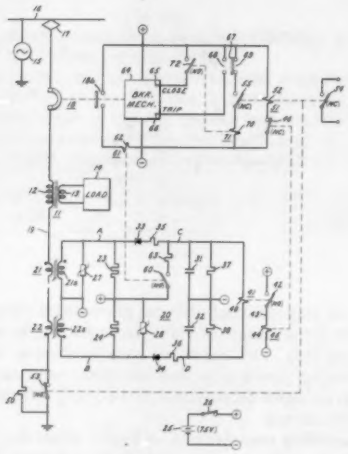
Filed Oct. 25, 1977, Ser. No. 844,773
Int. Cl.[2] H02H *7/04*
U.S. Cl. 361—36 **6 Claims**

1. A system for detecting a d-c component of current in a power transformer winding energized by an a-c source, comprising:

a. first and second current transducers each having a saturable core adapted to be magnetized by alternating current flowing between the power transformer winding and the a-c source and having a secondary winding on said core;

b. bias means associated with said current transducers for presaturating their respective cores in opposite directions by equal predetermined amounts of magnetomotive force; and

c. means connected to the secondary windings of said first and second current transducers for deriving an output signal in response to voltage induced in one of said secondary windings as a result of alternating current containing a d-c component in the power transformer winding,



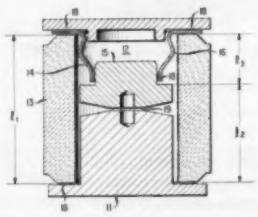
which current has sufficient peak magnitude to unsaturate the core of one of said current transducers, said output signal deriving means being arranged to prevent the output signal from being derived whenever voltages of substantially equal magnitudes are induced in both of said secondary windings as a result of symmetrical alternating current of relatively high amplitude in the power transformer winding.

4,175,277

VOLTAGE SURGE PROTECTOR

Paul Zuk, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 8, 1976, Ser. No. 739,470
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—120 **5 Claims**



1. A surge protector comprising a tubular insulating housing and two electrodes defining a spark gap within the housing, the electrodes each being provided with a flange, the flanges each engaging one end of the housing and being affixed thereto characterized in that at least one of the electrodes consists essentially of a metal flanged support member and a metal electrode cap telescopically engaging the support member opposite the flange and soldered thereto by means of a fusible metal alloy, whereby the width of the spark gap between the electrode cap and the opposite electrode is determined by

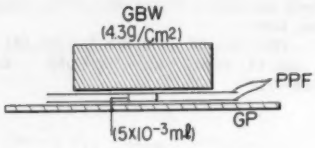
differential contraction of the electrodes relative to the housing during cooling from the brazing temperature to ambient temperature.

4,175,278

ELECTRIC INSULATING OIL COMPOSITIONS

Atsushi Sato; Isoo Shimizu, both of Yokohama, and Eiichi Matsuzaka, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Apr. 6, 1978, Ser. No. 894,117
Claims priority, application Japan, Apr. 13, 1977, 52-41557
Int. Cl.[2] C10G *37/08;* H01B *3/22, 7/00*
U.S. Cl. 361—315 **8 Claims**



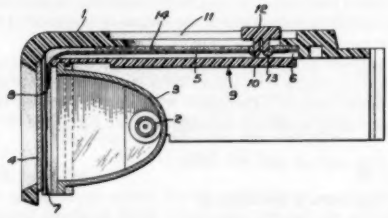
1. Electric insulating oil compositions comprising distillates within a boiling range in terms of normal pressure between 265° C. and 360° C. obtained by processing a hydrocarbon mixture from cracking of petroleum hydrocarbons at a temperature of 700° C. or higher principally composed of components with a boiling range between 75° C. and 198° C., said components consisting essentially of monocyclic aromatics and comprising aromatic olefins of said boiling range in liquid phase in the presence of an acid catalyst uder such conditions that the reaction temperature is from 0° C. to 200° C., the liquid residence time is from 0.1 hour to 5 hours and the concentration of aromatic olefins initially in the reaction system is 10% by weight or below.

4,175,279

FLASH UNIT FOR A CAMERA

James T. Asaki, Middletown, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Oct. 31, 1977, Ser. No. 847,286
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—18 **20 Claims**



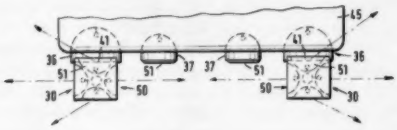
1. A filter for a light source comprising in combination:
a translucent flexible filter material; and
means for actuating said filter material into an operative position in front of said light source and to retract said filter material into an inoperative position removed from in front of said light source;
said means for actuating including
a pair of tracks, each of said pair of tracks being associated with a different one of the longitudinal edges of said filter material to contain and guide said filter material when it is actuated.

4,175,280

HEADLIGHT GLARE REDUCTION DEVICES FOR VEHICLES

Anna Plewka, Nahestr. 7, 4300 Essen-Kettwig, Fed. Rep. of Germany

Filed Oct. 28, 1977, Ser. No. 846,540
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2649947
Int. Cl.[2] F21V *3/00*
U.S. Cl. 362—61 **8 Claims**



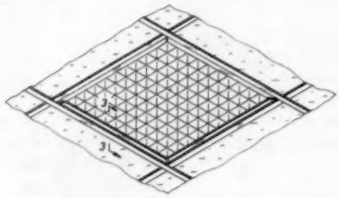
1. Apparatus for reducing the glare of headlights of vehicles, comprising:
at least one additional light for lighting up the surroundings of the vehicle headlight and being mounted such that it does not emit direct light in the direction of travel and is structurally combined with the headlight, said additional light being mounted in a hollow body, reflectors mounted behind light sources and directed towards all sides and aiming in all directions with the exception of the direction of travel as well as the opposite direction and that said at least one additional light being attached to the front edge of a vehicle headlight by means of a mounting support, whereby at least one reflector is directed substantially parallel to the light emission surface of the vehicle headlights to floodlight the front part of the vehicle, its lateral surroundings as well as the area ahead.

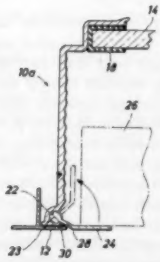
4,175,281

CEILING MOUNTED SUPPORT STRUCTURE

Wayne F. Lonseth, Austin, Tex., assignor to Esquire, Inc., New York, N.Y.

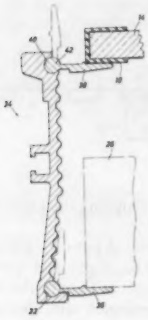
Filed Aug. 22, 1978, Ser. No. 908,069
Int. Cl.[2] F21S *1/02, 3/02;* F21V *17/00, 19/00, 21/02;* E04B *5/52;* E05C *3/04*
U.S. Cl. 362—148 **9 Claims**





1. Support apparatus for ceiling mounting at least a portion of a light fixture located within a ceiling opening at least par-

tially surrounded by a building structure presenting a lip toward the opening, comprising



a frame piece for resting on the lip of the building structure and having an elongate slot therein open on the side thereof toward the ceiling opening, and

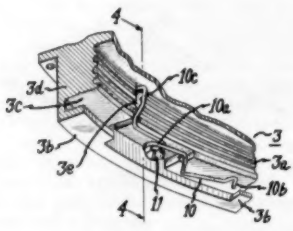
an elongate flipper bar having one edge operating within said slot, the edge of the slot limiting movement of said flipper bar to a support position for providing support for at least a portion of the fixture.

4,175,282

LUMINAIRE ATTACHMENT DEVICE

James L. Grindle, and Walter R. Blake, both of Hendersonville, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,647
Int. Cl.[2] F21S *1/10*
U.S. Cl. 362—363 **8 Claims**



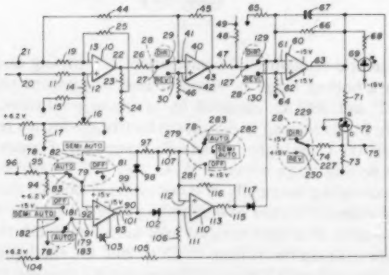
1. A luminaire comprising, in combination, support means comprising a socket having a screw-threaded wall defining a socket bore open at one end, said wall having an opening therein, an elongated spring member having an intermediate mounting portion and opposite end portions, said spring member secured to said socket wall with one end portion received in said wall opening and normally protruding therefrom into said socket bore, the opposite end portion of said spring member extending along said wall and formed with a catch portion, optical means having an open top threadably engaging said screw- threaded socket wall and yieldably engaged by said protruding spring end portion for firmly holding said optical means in removable assembly in said socket, and a cage-like guard having an open end secured to said support means and extending around said optical means, said support means having inwardly directed flange means at the open end of said socket, said guard formed at its open end with a shoulder portion, said guard being rotatable in one direction relative to said support means with said shoulder portion engaging said flange means for moving said guard into attached position, said shoulder portion formed with recess means engaged by said spring catch portion for yieldably holding said guard in attached position on said support means, said guard being rotatable in the opposite direction for releasing said recess means thereof from said spring catch portion for detaching said guard from said attached position.

4,175,283

BATCH OPTION MODULE

Warren G. Buchwald, and David W. Norris, both of Marshalltown, Iowa, assignors to Fisher Controls Company, Inc., Marshalltown, Iowa

Filed Apr. 24, 1978, Ser. No. 899,131
Int. Cl.[2] G06G *7/66, 7/58;* **G05B** *11/36*
U.S. Cl. 364—117 **3 Claims**



1. A Batch Option Module for a process control instrument, comprising:

first amplifier means for comparing the measured process variable and the setpoint of said process control instrument;

means for biasing the output of said first amplifier means;

second amplifier means for adding the setpoint to the output of said first amplifier means;

third amplifier means for preventing the output of said process control instrument in direct action from exceeding the absolute magnitude of the output of said second amplifier means and for preventing the output of said process control instrument in reverse action from being less than the absolute magnitude of the output of said second amplifier means;

means controlled by the output of said third amplifier means, for controlling the current flow to the integrator of said process control instrument whereby the output of said instrument is limited according to the formulas:

$$VHL = SP + K\,(SP - PV - B) \text{ or}$$

$$VLL = SP + K\,(PV - SP + B)$$

in which

VHL = high limit

VLL = low limit

SP = setpoint

PV = process variable

B = bias

K = gain; and

first and second comparator means for activating said Batch Option Module when said process control instrument approaches the limits of its control range and for deactivating said Batch Option Module when said process control instrument is within its normal control range.

4,175,284

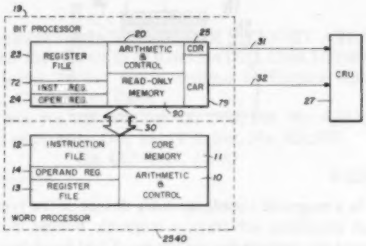
MULTI-MODE PROCESS CONTROL COMPUTER WITH BIT PROCESSING

George P. Shuraym, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 178,804, Sep. 8, 1971, abandoned, which is a continuation of Ser. No. 843,614, Jul. 22, 1969, abandoned. This application Nov. 21, 1973, Ser. No. 418,011

Int. Cl.[2] G06F *7/00*

U.S. Cl. 364—200 **8 Claims**



1. A data processing system comprising:

(a) a memory for storing instructions,

(b) an instruction processing unit adapted to decode said instructions,

(c) a communication register having a plurality of binary bit positions, each bit position having a bistable state,

(d) an external controlling device connected directly to a first bit position in said communication register for setting said first bit position to either one of said bistable states,

(e) an externally controlled device connected directly to a second bit position of said communication register, said controlled device being responsive to and controlled by the state of said second bit position,

(f) logic means responsive to an instruction decoded by said instruction processing unit for directly addressing said first and second bit positions, said logic means including:

(i) testing means for testing the condition of said first bit position as set by said controlling device, and

(ii) means for setting said second bit position in said communication register to either one of said bistable states, and

(g) wherein said controlling device provides a bit of data to said data processing system via said first bit position in said communication register and wherein said controlled device is controlled by the state of said second bit position in said communication register.

4,175,285

NAVIGATIONAL SYSTEM OF HIGH-SPEED AIRCRAFT

Jean Dansac, Paris, and Georges Couderc, Meudon, both of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 25, 1967, Ser. No. 665,195

Int. Cl.[2] G06F *15/50*

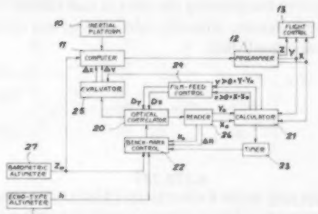
U.S. Cl. 364—456 **17 Claims**

1. A navigational system for the guidance of an aircraft on a high-speed overland flight, comprising aboard the aircraft, in combination with autopilot means for substantially holding the aircraft on a predetermined course and measuring means for taking instantaneous readings of a reference parameter of the overflown terrain;

recording means bearing a plurality of two-dimensional arrays of optically explorable prerecorded markings representing the values of said reference parameter in different elemental areas of respective measuring zones, each array encompassing a series of regions of uncertainty centered on respective measuring points along a simulated trajectory representing said predetermined course within a respective measuring zone, the extent of said regions of uncertainty being determined by the maximum possible deviation of the flight path of the aircraft under the control of said autopilot means from said predetermined course during travel from a preceding point of coincidence between said predetermined course and said flight path;

evaluation means forming a receiving surface;

comparison means including an orientable bench mark displaceable in response to said measuring means for indicating the reference parameter of the terrain actually overflown at successive instants during passage through a measuring zone, said comparison means further including optical correlator means for concurrently directing light rays upon said bench mark and upon the prerecorded markings of a given zone of uncertainty to correlate said bench mark with any of said markings representing the same reference parameter and to focus the light rays from the last-mentioned markings onto said receiving surface, thereby producing on said surface a contour line defined by all locations within the region of uncertainty having the same reference parameter;



programming means for relatively displacing said correlator means and any of said arrays during a respective measuring interval at an average rate proportional to the presumed speed of the aircraft and in a direction keeping said correlator means trained upon said simulated trajectory of the array and for repetitively operating both said measuring means and said comparison means throughout said measuring interval to sample the markings of an array and to project upon said receiving surface a plurality of intersecting contour lines during passage of the aircraft through any given measuring zone; and

storage means in said evaluation means for retaining information from the projected contour lines throughout said measuring interval and developing a cumulative output at a location corresponding to the point of intersection of the contour lines on said receiving surface, thereby indicating the true location of said flight path with reference to said predetermined course.

4,175,286

BURN-IN TEST SYSTEM FOR ELECTRONIC APPARATUS

Arthur C. Hunter, Lubbock County, and Lloyd E. Norman, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 19, 1978, Ser. No. 870,697

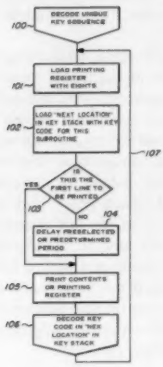
Int. Cl.[2] G06F *3/12, 11/06*

U.S. Cl. 364—737 **18 Claims**

1. A method of performing a burn-in test of an electronic apparatus having a keyboard and an output device comprising the steps of:

(a) decoding an unusual sequence of key depressions at said keyboard, said unusual sequence being a sequence which would not be encountered during the normal operation of said apparatus;

(b) loading an output register with data in response to the decoding of the unusual key sequence; and



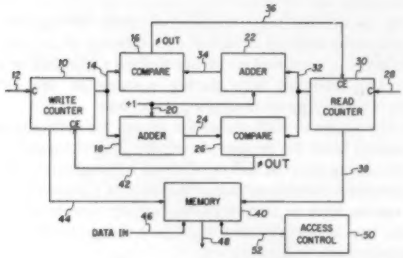
(c) repetitively transferring the data in said output register to said output device, whereby said burn-in test of said apparatus is accomplished.

4,175,287

ELASTIC STORE SLIP CONTROL CIRCUIT APPARATUS AND METHOD FOR PREVENTING OVERLAPPING SEQUENTIAL READ AND WRITE OPERATIONS

James L. Fuhrman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 23, 1978, Ser. No. 871,575
Int. Cl.² G06F *11/00, 13/00*
U.S. Cl. 364—900 **4 Claims**



1. The electrical circuit method of preventing overlapping sequential read and write operations in the same section of a multisection memory having a minimum of four sections due to nonsynchronized read and write clock pulses, comprising the steps of:

alternately and sequentially reading and writing data into count addressable areas of a multisection memory;

binary digitally counting clock pulses used in actuating read and write operations as they progress from section to section with the portion of the counts, which designate a section, forming the most significant bits of the read and write operation addresses;

logically monitoring the read and write section counts; and

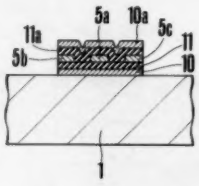
advancing the section count portion of the operation address of one of said read and write operations only when the advancement of that operation will not result in both read and write operations occurring in the same section of said multisection memory.

4,175,288

MAGNETIC BUBBLE MEMORY DEVICES

Hirofumi Ohta; Toshio Futami, and Kazuo Umeyama, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,586
Claims priority, application Japan, Apr. 27, 1977, 52-47907
Int. Cl.² G11C *19/08*
U.S. Cl. 365—2 **4 Claims**



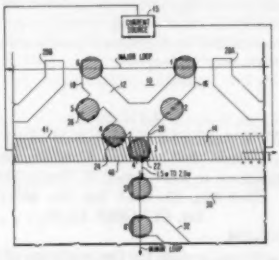
1. In a magnetic bubble memory device of the type comprising an insulating substrate, a magnetic bubble memory chip disposed at substantially the center of said insulating substrate, a plurality of lead pins secured to said insulating substrate at the end thereof, a plurality of planar electrically conducting lines comprising signal lines and ground lines formed on said insulating substrate between said magnetic bubble memory chip and said lead pins for passing small output signals, means for applying a perpendicular bias magnetic field to said magnetic bubble memory chip, and coils for producing a rotating magnetic field in a direction parallel with said memory chip, the improvement which comprises a plurality of grounded conductors including said ground lines disposed to surround signal lines of said plurality of lines for electrostatically shielding the same from said coils so as to decrease noise induced in said signal lines by a voltage developing across said coils.

4,175,289

SERRATED Y-BAR MAGNETIC BUBBLE SWITCH

Thomas W. Collins, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,805
Int. Cl.² G11C *19/08*
U.S. Cl. 365—15 **14 Claims**



1. A switch for bubble domains adapted to operate in a drive-to-transfer mode comprising:

a first magnetic element for propagating bubble domains and having a shape generally defining the letter Y with first and second arms and a stem, said element having a first propagation path along said first arm of said Y into said stem and then along said second arm of said Y, said element having a second propagation path along said first arm of said Y and then outward along said stem;

at least one serration connected to said second arm and in the vicinity of said stem;

a conductor positioned over the end of said stem and

a second magnetic element for propagating bubble domains being located a distance of about 1.5w to 2.0w from said stem where w is one-half the diameter of the bubble domain wherein in the absence of current in said conductor, a bubble positioned near the end of said stem is propagated to said serration as the magnetic field rotates and then along the second arm of said Y, and in the presence of current in said conductor a bubble positioned near the end of said stem is propagated outward away from said stem as the magnetic field rotates to said second magnetic element.

4,175,290

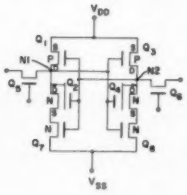
INTEGRATED SEMICONDUCTOR MEMORY ARRAY HAVING IMPROVED LOGIC LATCH CIRCUITRY

Eliyahou Harari, Irvine, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 819,794, Jul. 28, 1977, Pat. No. 4,132,904. This application Oct. 16, 1978, Ser. No. 952,507

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—156 **5 Claims**



1. An integrated semiconductor memory array comprising in combination:

(a) a plurality of latch circuits arranged in columns and rows, each latch circuit having a pair of branches, each branch comprising an IGFET driver and an IGFET load connected in series drain-to-drain at a common node, the control gate of the IGFET driver of each branch of a latch being connected to the node of the other branch of that latch, at least one IGFET of each latch having a variable threshold voltage;

(b) means for normally maintaining a first voltage across the two branches of all of said latches which is below that required to change the thresholds of the variable threshold IGFETs of those branches;

(c) means for applying an input signal to at least one node of each latch in a selected column so as to store information in said latch in volatile form;

(d) means for selectively enabling all latches in a given row to receive said input signals so that, by means of the last two named means any one or more of said latches may be selected to receive information in volatile form, thereby achieving volatile storage of information in all of said selected latches;

(e) means for temporarily raising the voltage across all of said branches a second, higher, level which is sufficient to cause a long term change in the thresholds of all of said variable threshold transistors, thereby achieving non-volatile storage of the volatile information in all of said latches; and

(f) means for applying substantially identical voltages to both nodes of at least one selected latch, while maintaining said first voltage across all of said latches, for selectively obliterating the volatile information content of only said selected latch, resulting in said selected latch assuming the state dictated by the threshold state of its at least one variable threshold IGFET without disturbing the volatile information contents of non-selected latches.

4,175,291

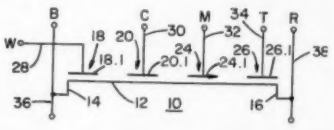
NON-VOLATILE RANDOM ACCESS MEMORY CELL

Wendell Spence, San Jose, Calif., assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 714,457, Aug. 16, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,207

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—184 **11 Claims**



1. A random access memory cell formed in a substrate of a given conductivity having a surface and at least one opposite conductivity region formed in the substrate for having signal information applied thereto, the cell comprising:

a capacitor having one electrode thereof formed by the substrate for volatilely storing signal information;

a first transistor, the first transistor having a channel formed in the substrate adjacent the capacitor electrode for transferring signal information from the opposite conductivity region via the channel to the capacitor;

a second transistor, the second transistor having a channel formed in the substrate communicating with the said one electrode of the capacitor for transferring signal information therebetween and having an alterable conduction threshold and being selectively activated by the volatile signal information in the capacitor to a predetermined threshold state; and

a third transistor, the third transistor having a channel formed in the substrate communicating with the second transistor channel for transferring signal information therebetween and cooperating with the opposite conductivity region and the second transistor for restoring signal information to the capacitor;

the predetermined threshold state of the alterable threshold second transistor controlling the restoring of signal information to the capacitor.

DESIGN PATENTS

GRANTED NOV. 20, 1979

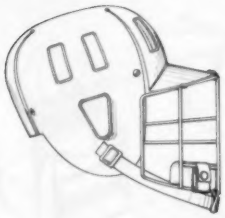
ERRATA

For CLASS	See PATENT NO.
D06–157	253,450
D08–395	253,457
D24–099	253,492

DESIGNS

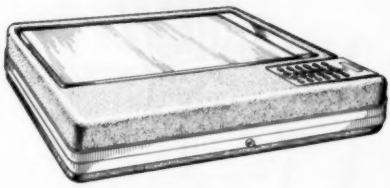
NOVEMBER 20, 1979

253,436
PROTECTIVE SPORTS HELMET
George Lynn, Ottawa, Canada, assignor to W. H. Brine Company, Needham, Mass.
Filed Feb. 17, 1978, Ser. No. 878,934
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



253,437
FOOT DECORATION
Margaret A. Jensen, 3437 Trumbull, San Diego, Calif. 92106
Filed Dec. 27, 1977, Ser. No. 864,531
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D2—270

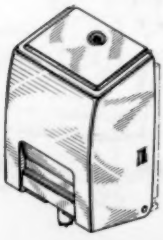
253,438
COMBINED WORK CASE, PAD HOLDER AND CALCULATOR
Harold T. Markley, 23455 Wedgewood Ct. North, Elkhart, Ind. 46514
Filed Sep. 6, 1977, Ser. No. 830,488
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—76



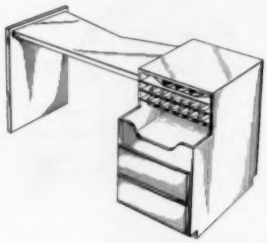
253,439
EASY CHAIR
Jean Prevost, 18 Bis rue Danielle Casanova, 94170 Le Perreux, France
Filed Jun. 17, 1977, Ser. No. 807,749
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

253,440
CHAIR
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc.
Filed Aug. 8, 1977, Ser. No. 822,604
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

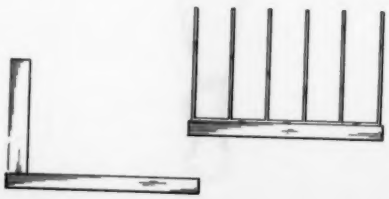
253,441
COMBINED SOAP DISPENSER CASING, DISPENSING LEVER AND DISPENSING NOZZLE
Council A. Tucker, Los Angeles, Calif., assignor to Towlsaver, Inc.
Filed Mar. 6, 1978, Ser. No. 884,034
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



253,442
FITTING TABLE
Stephen U. Winig, Narberth, Pa., assignor to American Optical Corporation, Southbridge, Mass.
Filed Aug. 5, 1977, Ser. No. 822,029
The portion of the term of this patent subsequent to Mar. 13, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162



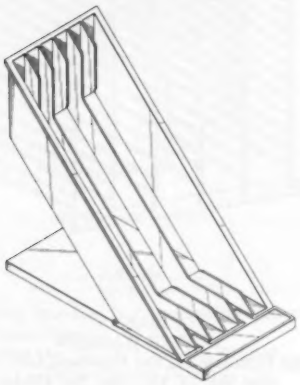
253,443
RECORD RACK
Samuel L. Beder, South Salem, N.Y., assignor to Le-Bo Products Company, Inc., Maspeth, N.Y.
Filed Jan. 3, 1978, Ser. No. 866,602
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—185



253,444
PHONOGRAPH RECORD RACK

Gregory Mathus, Sudbur, and Edward Yonkers, Newton, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

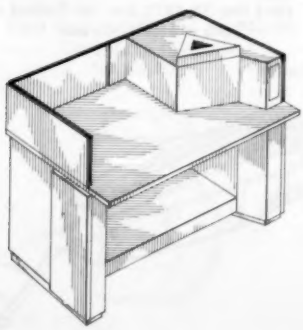
Filed Sep. 2, 1977, Ser. No. 830,361
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—185



253,445
DATA PROCESSING WORK STATION OR THE LIKE

George R. Daniels, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

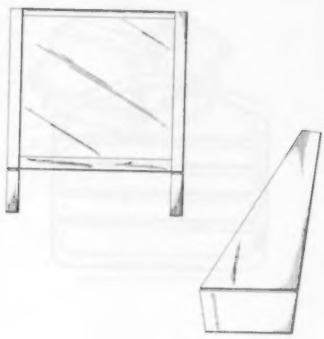
Filed Aug. 19, 1977, Ser. No. 825,876
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D6—186



253,446
FITTING MIRROR

Stephen U. Winig, Narberth, Pa., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 29, 1977, Ser. No. 865,459
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235

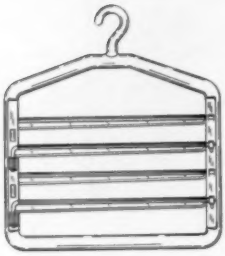


253,447
CLOTHES HANGER

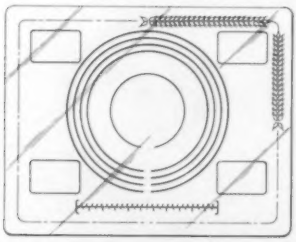
Gene Tully, P.O. Box 64, McIntosh, Fla. 32664

Filed May 31, 1977, Ser. No. 801,565
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—248

253,448
PANTS HANGER
Mack Salladay, Pittsburgh, Pa., assignor to Action Industries, Inc., Cheswick, Pa.
Filed Sep. 26, 1977, Ser. No. 836,504
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—256

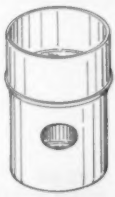


253,449
PASTRY SHEET OR THE LIKE
Ann K. Fritz, Woonsocket, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Oct. 25, 1977, Ser. No. 844,774
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—41

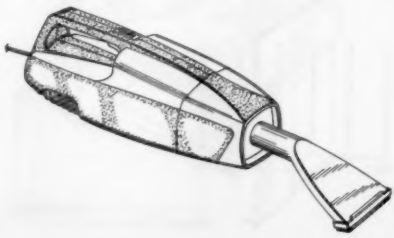


253,450
FABRIC DISPLAY RACK
Donald A. Butcher, Burlington, and Marvin L. Barbee, Glen Raven, both of N.C., assignors to Marquette Electronics, Inc.
Filed Mar. 20, 1978, Ser. No. 890,701
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157

253,451
BUTTER WARMER
Win Ng, 282 Franconia St., San Francisco, Calif. 94110
Filed Sep. 21, 1977, Ser. No. 835,463
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—125



253,452
HAND-HELD VACUUM CLEANER
Suen S. Tack, Hong Kong, Hong Kong, assignor to Bon-Aire Industries, Inc.
Filed Sep. 23, 1977, Ser. No. 836,045
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—164

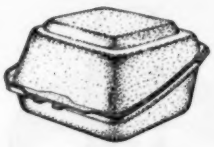


253,453
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Aug. 22, 1977, Ser. No. 826,449
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111

253,454
BOTTLE
W. Horton Earle, Brewster, N.Y., assignor to Richardson-Merrell Inc., Wilton, Conn.
Filed Oct. 11, 1977, Ser. No. 841,040
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—128

253,455
BOTTLE
Geoffrey Beene, New York, N.Y., assignor to Geoffrey Beene, Inc., New York, N.Y.
Filed Mar. 31, 1977, Ser. No. 783,402
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—145

253,456
PACKAGING CONTAINER FOR FOOD OR THE LIKE
Joe R. Payne, La Habra, Calif., assignor to Keyes Fibre Company
Filed Mar. 15, 1977, Ser. No. 777,723
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182



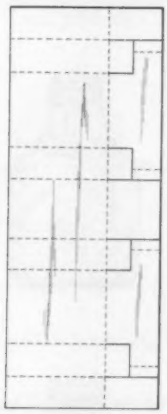
253,457
DRAPE CLAMP HOLDER
Dan Sandel, 17000 Cotter Pl., Encino, Calif. 91436
Filed Dec. 5, 1977, Ser. No. 857,800
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395

253,458
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,677
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131

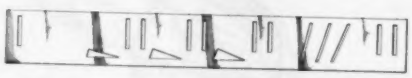
253,459
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,679
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131

253,460
COSMETIC CONTAINER
John C. White, Easton, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.
Filed Aug. 15, 1977, Ser. No. 824,866
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

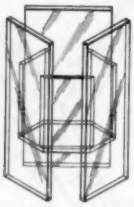
253,461
CARTON BLANK
Thomas B. Dempster, Sioux City, Iowa, assignor to Champion International Corporation, Stamford, Conn.
Filed May 18, 1977, Ser. No. 798,035
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



253,462
BUILDING LAYOUT INSTRUMENT
A. Frank Packard, SW. 165 2-9 Dr., Nineveh, Ind. 46164
Filed Nov. 17, 1977, Ser. No. 852,310
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D10—64

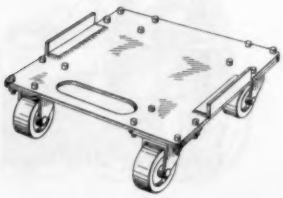


253,463
PLANTER OR SIMILAR ARTICLE
William B. Ailes, II, 17572 Lakeshore Blvd., Cleveland, Ohio 44119
Filed Mar. 16, 1978, Ser. No. 887,176
Term of patent 14 years
Int. Cl. D11—*02;* D6—*06;* D26—*01*
U.S. Cl. D11—143

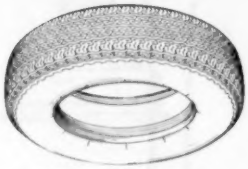


253,464
DESK ORNAMENT OR SIMILAR ARTICLE
Roy D. Elder, Box 314, Oakhurst, Okla. 74050
Filed Sep. 8, 1977, Ser. No. 831,545
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

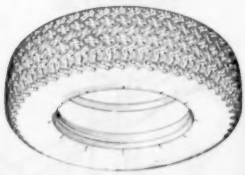
253,465
AUTO WHEEL SUPPORT DOLLY OR SIMILAR ARTICLE
Thomas Lobdell, 1411 Summit Ct., Mukwonago, Wis. 53149
Filed Apr. 17, 1978, Ser. No. 896,921
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—31



253,466
VEHICLE TIRE
Hiroshi Kojima, Hino; Masahiro Takayama, Musashino, and Hideaki Nishio, Kunitachi, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jul. 24, 1978, Ser. No. 928,041
Claims priority, application Japan, Feb. 28, 1978, 53-7132
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—141

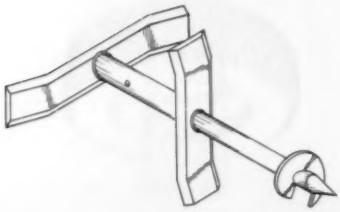


253,467
VEHICLE TIRE
Sakae Ezura, Matsudo, and Hiroshi Kojima, Hino, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jul. 24, 1978, Ser. No. 927,433
Claims priority, application Japan, Feb. 13, 1978, 53-4581
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



253,468
MICROPHONE
Donald W. Peterson, Conneaut, Ohio, assignor to The Astatic Corporation, Conneaut, Ohio
Filed Jun. 15, 1978, Ser. No. 915,948
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

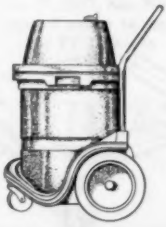
253,469
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,159
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



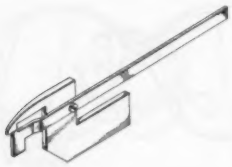
253,470
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,289
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12

253,471
CARPET CLEANER
Eugene L. Bothun, Berthoud, and Thomas G. Cannon, Fort Collins, both of Colo., assignors to Clarke-Gravely Corporation, Muskegon, Mich.
Filed Oct. 11, 1977, Ser. No. 841,160
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—53

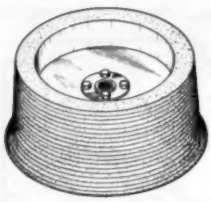
253,472
VACUUM CLEANER
Thomas G. Cannon, Bellvue, and Eugene L. Bothun, Berthoud, both of Colo., assignors to Clarke-Gravely Corporation, Muskegon, Mich.
Filed Nov. 18, 1977, Ser. No. 852,864
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—54



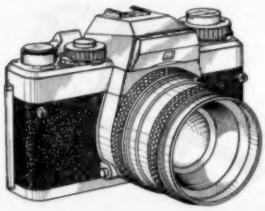
253,473
GATED HOOK FOR TUFTING MACHINES
Paul E. Jolley, Chattanooga, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.
Filed Jan. 31, 1978, Ser. No. 873,964
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—78



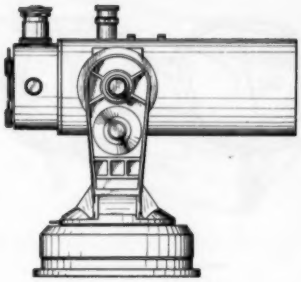
253,474
GRINDING WHEEL
Robert L. Chaykin, 7615 Gladstone, Reno, Nev. 89506
Filed Mar. 28, 1977, Ser. No. 782,180
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

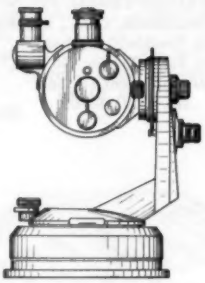


253,475
PHOTOGRAPHIC CAMERA
Jochen Kramer, Wolfsburg; Hans Schönfeld, Wolfsburg-Hattorf; Friedrich Papke, Brunswick; Dieter Mankau, Brunswick; Heinz Hamm, Brunswick, and Lothar Westerweck, Braunschweig-Leiferde, all of Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany
Filed Oct. 26, 1977, Ser. No. 845,571
Claims priority, application Fed. Rep. of Germany, May 2, 1977, 1124
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06



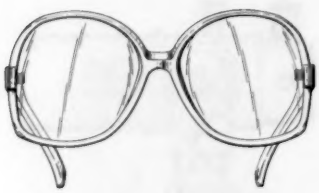
253,476
TELESCOPE
John J. Schneck, Phillips Mill Rd., Solebury, Pa. 18963, and Robert R. Richardson, 11 Concord Pl., Hatboro, Pa. 19040
Filed Jan. 16, 1978, Ser. No. 869,490
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—60





253,477
PAIR OF SPECTACLES
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 3, 1978, Ser. No. 866,327
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

253,478
PAIR OF SPECTACLES
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 3, 1978, Ser. No. 866,329
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

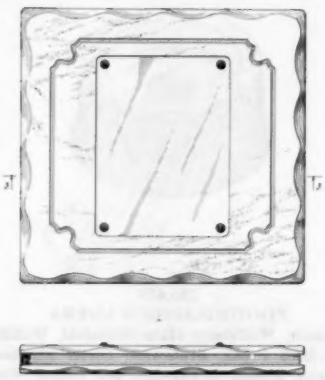


253,479
SPECTACLES FRAME FRONT
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 19, 1978, Ser. No. 870,775
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

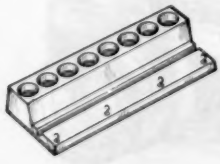
253,480
PAIR OF SPECTACLES
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Mar. 3, 1978, Ser. No. 883,024
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

253,481
PAIR OF SPECTACLES
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Apr. 27, 1978, Ser. No. 900,450
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

253,482
PHOTOGRAPH ALBUM
Joseph Abruzzo, Jr., Bridgeport, Conn., assignor to The Holson Company, Wilton, Conn.
Filed Oct. 3, 1977, Ser. No. 838,935
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



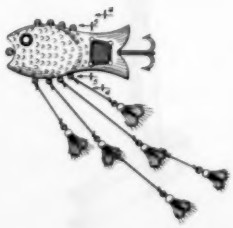
253,483
CRAFT BOARD FOR RUG MAKING
Frieda P. Thuringer, 2755 Hillcrest Dr., Wellsville, N.Y. 14895
Filed Mar. 23, 1978, Ser. No. 889,620
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35



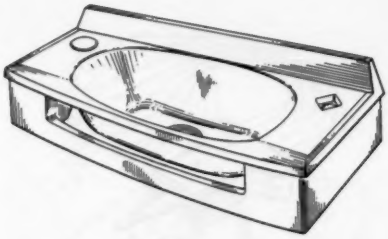
253,484
FIGURE TOY
Shigeru Saitoh, Tokyo, Japan, assignor to Masudaya Toy Company Limited, Tokyo, Japan
Filed Jun. 22, 1977, Ser. No. 809,104
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

253,485
RIFLE
Marion M. Robinson, Woodlands, Tex., assignor to Golden Eagle Firearms, Inc., Houston, Tex.
Filed Jul. 5, 1977, Ser. No. 813,221
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—6

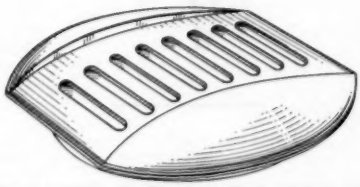
253,486
FISHING LURE
Paul Wigutow, 155 Harbor Dr., Apartment 2712, Chicago, Ill. 60611
Filed May 6, 1977, Ser. No. 794,390
Term of patent 3½ years
Int. Cl. D22—*05*
U.S. Cl. D22—27



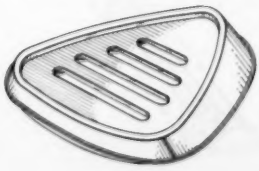
253,487
HAND BASIN
Bruce R. Thompson, Tranmere, Australia, assignor to United Packages Limited, Queensland, Australia
Filed Dec. 5, 1977, Ser. No. 857,276
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



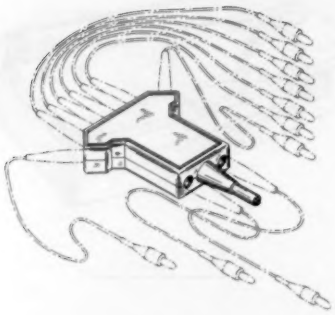
253,488
DISPENSER FOR AIR TREATING MATERIAL
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Mar. 20, 1978, Ser. No. 888,079
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



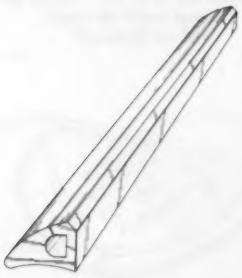
253,489
DISPENSER FOR AIR TREATING MATERIAL
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Mar. 20, 1978, Ser. No. 888,108
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



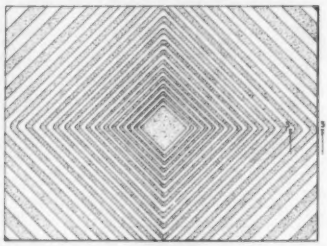
253,490
JUNCTION BOX FOR ELECTROCARDIOGRAPHIC LEADS
Gerald J. Reiser, Milwaukee, Wis., assignor to Marquette Electronics, Inc.
Filed Mar. 24, 1978, Ser. No. 889,828
Term of patent 14 years
Int. Cl. D24—*01;* D13—*03*
U.S. Cl. D24—29



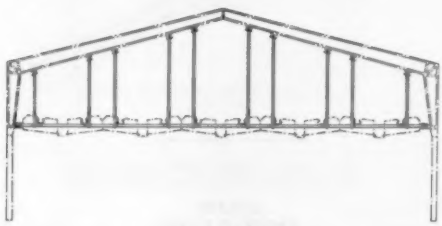
253,491
SEALING STRIPE FOR A LEVEL CROSSING BETWEEN A ROAD AND A RAILROAD
Sten Limmergård, Alvesta, and Stig H. G. Thim, Växjö, both of Sweden, assignors to A - Betong AB, Vaxjo, Sweden
Filed Apr. 6, 1978, Ser. No. 894,199
Claims priority, application Sweden, Oct. 7, 1977, 772011
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



253,492
STERILIZATION INDICATOR
Thomas A. Augurt, Stamford, Conn., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.
Filed Apr. 28, 1978, Ser. No. 901,267
Term of patent 14 years
Int. Cl. D24—*99;* D10—*04*
U.S. Cl. D24—99



253,493
BEAM SLING UNIT FOR SUSPENDING POULTRY CAGES
George E. France, 901 W. James St., Geneva, Ill. 60134
Continuation-in-part of Ser. No. 499,321, Aug. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 249,758, May 2, 1972, abandoned. This application Jul. 6, 1976, Ser. No. 702,519
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



253,494

FLASHLIGHT

Yeung Sit-Lae, Kowloon, Hong Kong, assignor to Herbert J. Ashe, South Norwalk, Conn.

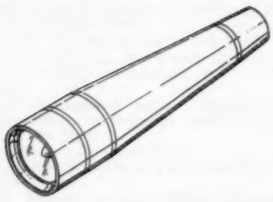
Filed Apr. 27, 1978, Ser. No. 901,279

Claims priority, application United Kingdom, Nov. 1, 1977, 982099

Term of patent 14 years

Int. Cl. D26—*02*

U.S. Cl. D48—24 A



253,495

ELECTRIC LAMP HOUSING FOR VEHICLES

Dale P. Bodine, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Sep. 12, 1977, Ser. No. 832,265

Term of patent 14 years

Int. Cl. D26—*06, 05*

U.S. Cl. D48—32 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF NOVEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See*—
Riehle, Frederick W., 4,174,777, Cl. 198-781.000.
Venzke, Charles E., 4,174,773, Cl. 198-365.000.

AB Casco: *See*—
Andersson, Sven-Erik, 4,175,065, Cl. 260-29.300.

AB Celleco: *See*—
Frykhult, Rune H., 4,175,036, Cl. 209-211.000.

AB Volvo Penta: *See*—
Meier, Hermann R. E., 4,174,685, Cl. 123-73.00A.

Abdulla, Riaz F.; and Fuhr, Kenneth H., to Eli Lilly and Company. α,β-Unsaturated ketones and aldehydes and method of preparation. 4,175,087, Cl. 260-586.00R.

Abe, Takashi; Kudo, Kazuo; and Kazato, Keiji, to Toppan Printing Co., Ltd. Hollow bottle and production method therefor. 4,174,783, Cl. 215-1.00C.

Abraham, Alan G.: *See*—
Richards, Gordon S.; Douglas, Peter E.; and Abraham, Alan G., 4,175,230, Cl. 250-199.000.

Adams, Daniel M., Jr.; Barach, Jeff T.; and Speck, Marvin L., to Research Triangle Institute. Inactivation of heat resistant bacterial proteases in ultra-high temperature treated milk. 4,175,141, Cl. 426-522.000.

Adlhart, Otto J., to Engelhard Minerals & Chemicals Corporation. Fuel cell system utilizing ion exchange membranes and bipolar plates. 4,175,165, Cl. 429-30.000.

Advance Transformer Company: *See*—
Feinberg, Albert E.; and Woo, Kenneth, 4,175,246, Cl. 315-101.000.

Affinita, Tommaso: *See*—
Maccario, Floriano A.; and Affinita, Tommaso, 4,174,911, Cl. 403-303.000.

Agawa, Yasushi, to Tokyo Shibaura Electric Co., Ltd. Fuel gauge. 4,174,626, Cl. 73-113.000.

Agency of Industrial Science and Technology, The: *See*—
Ohmae, Tsutomu; and Marumoto, Katsuji, 4,174,645, Cl. 74-866.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Frank, Karl, 4,174,968, Cl. 430-375.000.
Muller, Jurgen; Schmidt, Manfred; and Eickel, Rolf, 4,175,232, Cl. 250-315.200.
Odenwalder, Heinrich; and Ranz, Erwin, 4,174,969, Cl. 430-445.000.

Agrimel Ltd.: *See*—
Mantha, Nagaraja S., 4,175,121, Cl. 424-94.000.

Ainoura, Masato. Spherical hob for generating gears. 4,174,914, Cl. 407-26.000.

Air Industrie: *See*—
Denjean, Rene, 4,174,748, Cl. 165-5.000.

Airotechnik Siegfried Binder GmbH, Firma: *See*—
Binder, Siegfried; and Herzog, Karl, 4,174,811, Cl. 239-308.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Fujii, Takashi; and Kizaki, Jiro, 4,174,786, Cl. 220-378.000.

Akazawa, Susumu: *See*—
Tsuchiya, Takao; Akazawa, Susumu; and Murakami, Kyoichi, 4,175,241, Cl. 307-262.000.

Akebono Brake Industry Co., Ltd.: *See*—
Takemori, Fumio, 4,174,768, Cl. 188-72.300.

Akro Corporation, The: *See*—
Reuben, Harold, 4,174,991, Cl. 156-242.000.

Aktiebolaget Draco: *See*—
Moren, Nils F. E.; and Wetterlin, Kjell I. L., 4,174,712, Cl. 128-173.00R.

Albers, Edwin W.: *See*—
Edwards, Grant C.; Vaughan, David E. W.; and Albers, Edwin W., 4,175,059, Cl. 252-455.00Z.

Alfa-Laval AB: *See*—
Wuchse, Gunther R., 4,174,721, Cl. 134-58.00R.

Allen, Richard C.: *See*—
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,175,209, Cl. 562-473.000.

Allied Chemical Corporation: *See*—
Bollen, Philip S.; and Degrassi, Alfieri, 4,175,147, Cl. 428-35.000.
Spiliotis, Nicholas J., 4,175,011, Cl. 204-15.000.

Alps Electric Co., Ltd.: *See*—
Noji, Tasuku, 4,175,259, Cl. 334-49.000.

Aluminiumwerke AG. Rorschach: *See*—
Bachmann, Robert; and Sturm, Winfried, 4,175,140, Cl. 426-399.000.

AM International, Inc.: *See*—
Nelson, Alfred M.; and Davis, David L., 4,175,265, Cl. 346-74.100.

AMAX Inc.: *See*—
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Yu, Peter H., 4,175,014, Cl. 204-130.000.

American Chain & Cable Company, Inc.: *See*—
Raven, John, 4,174,639, Cl. 73-766.000.

American Cyanamid Company: *See*—
Miller, Frank, 4,175,208, Cl. 562-467.000.
Schiller, Arthur M.; Goodman, Richard M.; and Neff, Roger E., 4,175,100, Cl. 525-327.000.

American Hoechst Corporation: *See*—
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,175,209, Cl. 562-473.000.

American Optical Corporation: *See*—
Link, William T.; Haney, Jerry D.; and Jansen, William D., 4,174,707, Cl. 128-681.000.

American Telephone and Telegraph: *See*—
Kaemmerer, Harry, 4,175,271, Cl. 360-14.000.

Anderl, Peter: *See*—
Kappelsberger, Erwin; Anderl, Peter; and Steigerwald, Karl H., 4,175,226, Cl. 219-121.0EM.

Andersson, Leif: *See*—
Hunyadi, Laszlo; Andersson, Leif; and Mansson, Martin, 4,174,608, Cl. 60-39.650.

Andersson, Sven-Erik, to AB Casco. Method for glueing with curable, formaldehyde-based adhesives and a curing composition for use in the method. 4,175,065, Cl. 260-29.300.

Ansul Company, The: *See*—
Rasheed, Khalid; and Warkentin, James D., 4,175,186, Cl. 544-145.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,175,031, Cl. 208-138.000.

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Antosz, Frederick J.: *See*—
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,175,006, Cl. 435-55.000.

Anzai, Makoto, to Nissan Motor Company, Limited. Closed loop air-fuel ratio control system. 4,174,680, Cl. 123-32.0EE.

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Arai, Haruhiko: *See*—
Imamura, Tetsuya; Hiraide, Takashi; Arai, Haruhiko; and Hirakura, Megumu, 4,175,051, Cl. 252-91.000.

Arbuckle, Donald P. Rotary drill bit and method of forming bore hole. 4,174,759, Cl. 175-67.000.

ARCHIFAR Industrie Chimiche del Trentino S.p.A.: *See*—
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,175,077, Cl. 260-239.30P.

Ardeleanu, Stefan: *See*—
Teodorescu, Constantin; and Ardeleanu, Stefan, 4,174,921, Cl. 414-387.000.

Arena, John P.; McGuigan, Charles G.; and Rossi, Gene A., to United States of America, Navy. Self-adjusting tandem seal. 4,174,843, Cl. 277-3.000.

Argade, Shyam D.; and Coker, Thomas G., to BASF Wyandotte Corporation. Combined cathode and diaphragm unit for electrolytic cells. 4,175,023, Cl. 204-252.000.

Arias, Henry: *See*—
Breslow, Jeffrey D.; Ferris, Michael J.; Arias, Henry; and Wozniak, Walter J., 4,174,835, Cl. 273-101.000.

Arlemark, Jan M. Irrigation machine. 4,174,809, Cl. 239-189.000.

Armstrong, William A.; and Powell, Peter J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Zinc electrode for low temperature. 4,175,168, Cl. 429-229.000.

Arnold, Don C.; Silletti, Julio D.; Ritzenthaler, Richard L.; and Wilcox, Thomas J., to Elkay Manufacturing Company. Pressure balancing valve. 4,174,726, Cl. 137-100.000.

Arnott, Robert C.; and Willbanks, Charles E., to Milliken Research Corporation. Cylindrical screen having aperatures with geometric centers defined by arrays of equilateral triangles. 4,174,664, Cl. 101-127.000.

Artbauer, Jan, to Kabel- und Metallwerke Guthehoffnungshutte Aktiengesellschaft. Elecrtrical conductor assembly. 4,175,212, Cl. 174-128.00R.

Asahi Kasei Kogyo Kabusihiki Kaisha: *See*—
Ozawa, Kohe; Hosoya, Kazuhiro; Kurita, Jiro; and Honda, Makoto, 4,175,176, Cl. 526-309.000.

Asaki, James T., to International Telephone & Telegraph Corporation. Flash unit for a camera. 4,175,279, Cl. 362-18.000.

Asselman, George A. A.: *See*—
Nederlof, Anton M.; and Asselman, George A. A., 4,174,616, Cl. 60-517.000.

Associated Portland Cement Manufacturers Limited, The: *See*—
Shiel, Leslie E., 4,174,998, Cl. 162-168.00N.

Atari, Inc.: *See*—
Kearney, Phillip C., 4,174,836, Cl. 273-101.200.

Atlantic Richfield Company: *See*—
Striegler, John H., 4,174,629, Cl. 73-153.000.
Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., 4,174,953, Cl. 44-1.00R.

Auchter, Bruno; Wagner, Karl-Heinz; Glimm, Gunter; and Preiss, Manfred, to Rheinhutte vorm. Ludwig Beck & Co.; and Siemens Aktiengesellschaft. Liquid-gas pumping apparatus. 4,174,791, Cl. 222-333.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; and Bauder, Armin, 4,174,693, Cl. 123-139.0AW.

Auergesellschaft GmbH: *See*—
Pampuch, Klaus, 4,174,710, Cl. 128-142.700.

Austin, Richard D. Double acting concrete pump. 4,174,928, Cl. 417-397.000.

Axen, Rolf E. A. V.: *See*—
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., 4,175,073, Cl. 260-112.00R.

Ayano, Mitsutoshi; and Minamitani, Eiji, to Fujitsu Limited. Telephone switching system. 4,175,218, Cl. 179-170.200.

Ayers, John S., to Development Finance Corporation of New Zealand. Hydroxyalkylated cross-linked regenerated cellulose and method of preparation thereof. 4,175,183, Cl. 536-57.000.

Azami, Tadao: *See*—
Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, 4,175,163, Cl. 428-553.000.

Babcock & Wilcox Company, The: *See*—
Jabsen, Felix S., 4,175,000, Cl. 176-19.00R.
Jabsen, Felix S., 4,175,004, Cl. 176-76.000.

Babler, James H. Method of preparing E-4-acetoxy-2-methyl-2-butenal. 4,175,204, Cl. 560-262.000.

Bachl, Robert: *See*—
Schweier, Guenther; Bachl, Robert; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gruber, Wolfgang; and Kolk, Erich, 4,175,170, Cl. 526-125.000.

Bachmann, Robert; and Sturm, Winfried, to Aluminiumwerke AG. Rorschach; and BBC Brown Boveri & Company Limited. Method for automatic low-bacteria to aseptic filling and packing of foodstuffs employing ultraviolet radiation. 4,175,140, Cl. 426-399.000.

Bagga, Madan M.; and Moss, Noel S., to Ciba-Geigy Corporation. Powder coating compositions containing an epoxide resin and an acid hardener. 4,175,173, Cl. 528-97.000.

Baier, Robert E.: *See*—
DePalma, Vito A.; and Baier, Robert E., 4,175,233, Cl. 250-343.000.

Bakker, Pieter M.; and Kind, Cornelis E., to Shell Oil Company. Extraction process. 4,175,092, Cl. 260-456.00R.

Bala, Harry: *See*—
Mowli, John C.; and Bala, Harry, 4,174,597, Cl. 53-410.000.

Ball, William J.; and Stewart, David G., to British Petroleum Company Limited, The. Process for the production of synthesis gas by the catalyzed decomposition of methanol. 4,175,115, Cl. 423-415.00A.

Ballbarrow Corporation: *See*—
Brannan, John E., 4,174,871, Cl. 308-238.000.

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Wulff, Gunther, 4,174,676, Cl. 118-688.000.

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Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,174,564, Cl. 29-622.000.

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Adams, Daniel M., Jr.; Barach, Jeff T.; and Speck, Marvin L., 4,175,141, Cl. 426-522.000.

Barber, Justus C.: *See*—
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Barrows, Franklin H.: *See*—
Hunter, Byron A.; and Barrows, Franklin H., 4,175,200, Cl. 560-1.000.

Bartsch, Gunther M. Fireplace. 4,174,700, Cl. 126-121.000.

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Merkle, Hans; Mueller, Albrecht; and Zoller, Karl, 4,175,184, Cl. 544-10.000.
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BASF Wyandotte Corporation: *See*—
Argade, Shyam D.; and Coker, Thomas G., 4,175,023, Cl. 204-252.000.
Creamer, Edward D.; and Krumpelt, Michael, 4,175,025, Cl. 204-253.000.

Battelle Development Corporation: *See*—
Love, Robert B.; and Bowen, Alan W., 4,175,030, Cl. 204-298.000.

Bauder, Armin: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; and Bauder, Armin, 4,174,693, Cl. 123-139.0AW.

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Junge, Bodo; Krause, Hans-Peter; Muller, Lutz; Puls, Walter; and Stoltefuss, Jurgen, 4,175,123, Cl. 424-180.000.
Mohring, Edgar; and Muller, Hanns P., 4,175,015, Cl. 204-131.000.
Reitz, Gunther; and Boehmke, Gunther, 4,175,096, Cl. 260-556.00F.

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Wilson, Jeffrey V.; Schaefer, James H.; Glowacz, Anthony A.; and Bayha, Jack, 4,174,875, Cl. 339-91.00P.

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Bachmann, Robert; and Sturm, Winfried, 4,175,140, Cl. 426-399.000.

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Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,175,006, Cl. 435-55.000.

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Vistins, Maris, 4,174,542, Cl. 2-48.000.

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Flint, John R.; and Rady, Bruce A., 4,174,891, Cl. 353-26.00A.
Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,174,890, Cl. 353-26.00A.

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Chen, William I., 4,175,213, Cl. 178-70.00R.
Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., 4,174,983, Cl. 148-102.000.
Fleming, James W., Jr.; O'Bryan, Henry M., Jr.; and Thomson, John, Jr., 4,175,060, Cl. 252-518.000.
Zuk, Paul, 4,175,277, Cl. 361-120.000.

Belles, Wayne S.: *See*—
Strong, Philip L.; and Belles, Wayne S., 4,174,959, Cl. 71-92.000.

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Landau, Marvin; Bellettiere, Samuel J.; and Hoch, Samuel, 4,175,064, Cl. 260-22.0CA.

Belvin, David S.; Perry, Clifford R.; and Watkins, Dale F., to Boeing Company, The. Method of making heat exchange structure. 4,174,987, Cl. 156-197.000.

Bender, Paul E.; and Lantos, Ivan, to SmithKline Corporation. Pyridyl substituted 2,3-dihydroimidazo[2,1-b]thiazoles. 4,175,127, Cl. 424-263.000.

Bendix Corporation, The: *See*—
Klein, Bruce W.; and Jacko, Michael G., 4,175,070, Cl. 260-38.000.
Luchaco, David G., 4,174,681, Cl. 123-32.0EA.

Benedek, George B.: *See*—
Cannell, David S.; Giglio, Marzio; Benedek, George B.; von Schulthess, Gustav K.; and Cohen, Richard J., 4,174,952, Cl. 23-230.00B.

Benke, Gus A. Drug dispensing apparatus for a hunting arrow. 4,174,837, Cl. 273-106.50R.

Benney, Charles H.; and Filipi, Thomas J., to Whatman Inc. Process for packing chromatographic columns. 4,175,037, Cl. 210-31.00C.

Benton, Kenneth C.; and Williamson, Timothy J., to Standard Oil Company. Acrylonitrile block terpolymer barrier resins. 4,175,101, Cl. 525-88.000.

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Beny, Janos; and Herzig, Albert M. System for transferring water. 4,174,743, Cl. 141-18.000.

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Berger, Josef: *See*—
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Bergman, Raymond A. Bayonet clamping apparatus for machine tools. 4,174,828, Cl. 269-34.000.

Bergwerksverband GmbH: *See*—
Rohde, Wolfgang, 4,174,946, Cl. 432-14.000.

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Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000.

Bernhardt, Paul E. Lapidary device. 4,174,592, Cl. 51-101.00R.

Berry, David, to BP Chemicals Limited. Chemical composition. 4,175,090, Cl. 260-438.100.

Beschke, Helmut; Friedrich, Heinz; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of substituted pyridine (A). 4,175,195, Cl. 546-250.000.

Bethel, Everett L.: *See*—
Moore, Ronald D.; and Bethel, Everett L., 4,174,988, Cl. 156-213.000.

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Moyer, William H., Jr., 4,175,035, Cl. 209-5.000.

Beuchel, Peter H.; and Cooper, Eric G., to Westinghouse Electric Corp. Grid for nuclear reactor fuel assemblies. 4,175,003, Cl. 176-76.000.

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McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer, 4,174,829, Cl. 270-55.000.

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De Boel, Marcel; Baudin, Pol; Wasterlain, Michel; and Collignon, Pierre, 4,175,162, Cl. 428-428.000.

Bicking, John B.: *See—*
Cragoe, Edward J., Jr.; and Bicking, John B., 4,175,203, Cl. 560-55.000.

Bickley Furnaces, Inc.: *See—*
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Binder, Dieter; Hromatka, Otto; Pfister, Rudolf; and Zeller, Paul, to Hoffmann-La Roche Inc. Thienothiazine derivatives. 4,175,085, Cl. 549-65.000.

Binder, Siegfried; and Herzog, Karl, to Airotechnik Siegfried Binder GmbH, Firma. Fluid substance sprayer having propellant gas and substance refill. 4,174,811, Cl. 239-308.000.

Bio-Pharmaceutical Packaging Corp.: *See—*
White, Douglas J., 4,175,008, Cl. 435-295.000.

Biranowski, Jerome; and Faust, Kenneth J., to GAF Corporation. Decorative covering material. 4,175,155, Cl. 428-313.000.

Birkhamshaw, Ronald G., to Mathbirk, Limited. Machines for securing textile fabrics one to another. 4,174,670, Cl. 112-25.000.

Bittner, Helmut: *See—*
Bruderle, Ernst; Gottzein, Eveline; and Bittner, Helmut, 4,174,819, Cl. 244-169.000.

Bizzari, Venanzio; and Hogfors, Enar, to Bulten-Kanthal AB. Method of hot bending a generally straight wire blank. 4,175,228, Cl. 219-153.000.

Blackmer, Richard H.; and Hedman, Jonathan W., to Oxygen Enrichment Co., Ltd. Membrane oxygen enricher apparatus. 4,174,955, Cl. 55-158.000.

Blair, Henry O.: *See—*
Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., 4,174,728, Cl. 137-240.000.

Blake, Walter R.: *See—*
Grindle, James L.; and Blake, Walter R., 4,175,282, Cl. 362-363.000.

Blakey, Bruce H.; and Pohl, Douglas R., to Western Marine Electronics, Inc. Solar heat roofing system. 4,174,703, Cl. 126-430.000.

Blalock, Theron V.: *See—*
Borkowski, Casimer J.; and Blalock, Theron V., 4,175,258, Cl. 331-78.000.

Blomgren, Roland A.: *See—*
Shallenberg, Robert L.; Hufton, Austen B.; Blomgren, Roland A.; and Copeland, William M., 4,174,977, Cl. 134-6.000.

Bloom, Quentin M., to Bickley Furnaces, Inc. Furnace heating system. 4,174,951, Cl. 432-133.000.

Bobbio, Benedetto. Mechanical device for moving the lifters of the weaving machines. 4,174,737, Cl. 139-65.000.

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Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.

Boehmke, Gunther: *See—*
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Boeing Company, The: *See—*
Belvin, David S.; Perry, Clifford R.; and Watkins, Dale F., 4,174,987, Cl. 156-197.000.

Bohm, Leslie E.: *See—*
Jackson, W. Shaun; and Bohm, Leslie E., 4,174,795, Cl. 224-32.00A.

Boler, Jan B.; and Reichelt, Karl-Ludvig, to Sentralinstitutt for Industriell Forskning. Coupling products of biologically active amines. 4,175,084, Cl. 260-326.440.

Boles, Richard J., to Crest Circle, Inc. Golf clubs restrainer means for use with golf bag. 4,174,747, Cl. 150-1.50R.

Bollen, Philip S.; and Degrassi, Alfieri, to Allied Chemical Corporation. Method to reduce deposits of terephthalic acid on cooling rolls during sheet extrusion of amorphous polyethylene terephthalate. 4,175,147, Cl. 428-35.000.

Bolt, Reginald C.: *See—*
Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000.

Bonar & Bemis Ltd.: *See—*
Flantua, Gysbertus, 4,174,554, Cl. 24-30.50P.

Bonnemay, Maurice: *See—*
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Borg-Warner Corporation: *See—*
Tuzson, John J., 4,174,724, Cl. 137-56.000.

Borkowski, Casimer J.; and Blalock, Theron V., to United States of America, Energy. High level white noise generator. 4,175,258, Cl. 331-78.000.

Bornand, Jean-Daniel: *See—*
Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, 4,174,826, Cl. 266-227.000.

Bose, Arindam: *See—*
Tsao, George T.; Ladisch, Michael R.; and Bose, Arindam, 4,174,976, Cl. 127-37.000.

Bosse, Frank, to Windmoller & Holscher. Symmetrical sack with double side folds. 4,174,804, Cl. 229-55.000.

Bott, John A. Vehicle article carrier. 4,174,794, Cl. 224-320.000.

Bourgeois, Ronald D. Four-way diverting conveyor. 4,174,774, Cl. 198-.

Bourrelly, Jacques: *See—*
Gignier, Jean P.; and Bourrelly, Jacques, 4,175,192, Cl. 546-134.000.

Bowen, Alan W.: *See—*
Love, Robert B.; and Bowen, Alan W., 4,175,030, Cl. 204-298.000.

BP Chemicals Limited: *See—*
Berry, David, 4,175,090, Cl. 260-438.100.

Bradham, Allen C., III, to First Wisconsin National Bank of Wisconsin. Fluid flow metering tube with minimum pressure energy loss. 4,174,734, Cl. 138-39.000.

Bradley, Robert O.; Knighton, Heywood J.; and Naveaux, Robert J., to Toledo Engineering Company. Manifold inputs and outputs for furnace regenerators. 4,174,948, Cl. 432-54.000.

Branderud, Nils P.: *See—*
Linnman, Sven N. J.; Isoz, Peter; Branderud, Nils P.; and Udden, Per E. C., 4,175,255, Cl. 328-7.000.

Brannan, John E., to Ballbarrow Corporation. Material handling vehicle. 4,174,871, Cl. 308-238.000.

Breimesser, Fritz; Kuznia, Christian; and Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Switching arrangement for remote-controlled electrical loads. 4,175,238, Cl. 307-40.000.

Brenner, Douglas. Plasticization of neutralized sulfonated elastomeric polymer. 4,175,069, Cl. 260-32.60A.

Breslow, Jeffrey D.; Ferris, Michael J.; Arias, Henry; and Wozniak, Walter J., to Marvin Glass & Associates. Competitive game. 4,174,835, Cl. 273-101.000.

Brinkhof, Joseph B.; and Datt, Raymond R., to Canadian General Electric Company Limited. Engine block heater. 4,175,229, Cl. 219-208.000.

British Petroleum Company Limited, The: *See—*
Ball, William J.; and Stewart, David G., 4,175,115, Cl. 423-415.00A.
Davies, Evan E.; and Kolombos, Alexander J., 4,175,057, Cl. 252-455.00Z.

Brooks, Joseph F., to National Union Electric Corporation. Connection for securing a helically convoluted hose to a hose fitting. 4,174,858, Cl. 285-7.000.

Brower, Conrad J. Doweling guide. 4,174,917, Cl. 408-62.000.

Brown, Bryan O.: *See—*
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Brown, Paul R.: *See—*
Hirtreiter, Arthur B.; and Brown, Paul R., 4,174,827, Cl. 267-65.00B.

Brown, Richard E.; and Unangst, Paul C., to Warner-Lambert Company. Indolopyrones having antiallergic activity. 4,175,083, Cl. 260-326.12R.

Bruderle, Ernst; Gottzein, Eveline; and Bittner, Helmut, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Controller for the attitude stabilization of a satellite. 4,174,819, Cl. 244-169.000.

Buchner, Klaus, to Siemens Aktiengesellschaft. Ultrasonic imaging apparatus operating according to the impulse-echo method. 4,174,705, Cl. 128-660.000.

Buchwald, Warren G.; and Norris, David W., to Fisher Controls Company, Inc. Batch option module. 4,175,283, Cl. 364-117.000.

Bucyrus-Erie Company: *See—*
Learmont, Tom, 4,174,579, Cl. 37-116.000.

Budzich, Tadeusz. Load responsive valve assemblies. 4,174,613, Cl. 60-427.000.

Buidry, Kirby J. Process for manufacturing coupling gaskets for helically corrugated spiral pipe. 4,174,985, Cl. 156-244.180.

Bulten-Kanthal AB: *See—*
Bizzari, Venanzio; and Hogfors, Enar, 4,175,228, Cl. 219-153.000.

Bulten-Kanthal Aktiebolag: *See—*
Schrewelius, Nils G., 4,174,971, Cl. 106-44.000.

Bunker Ramo Corporation: *See—*
Morgan, Denny E., 4,175,250, Cl. 323-22.00T.

Bunnell, Douglas E.; Gauer, Joseph A.; Sherer, R. Bruce; and Scott, William F., to Whirlpool Corporation. Automatic washer suspension system. 4,174,622, Cl. 68-23.300.

Burgarella, John P.; and Carcia, Peter P., to Polaroid Corporation. Exposure control system for use in photographic camera apparatus. 4,174,893, Cl. 354-29.000.

Burk, Emmett H., Jr.: *See—*
Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., 4,174,953, Cl. 44-1.00R.

Burns, David C., to Westinghouse Electric Corp. Positioning means for circumferentially locating inspection apparatus in a nuclear reactor vessel. 4,174,999, Cl. 176-19.00R.

Burns, William V.: *See—*
Klein, William R.; and Burns, William V., 4,175,244, Cl. 313-315.000.

Burroughs Corporation: *See—*
Smith, John G., 4,174,566, Cl. 29-758.000.

Burroughs Wellcome Co.: *See—*
Lazarus, Norman R., 4,175,122, Cl. 424-177.000.

Burzdak, Louis. Bug catcher. 4,174,586, Cl. 43-134.000.

Buttner, Horace J. Pushbutton switch. 4,175,222, Cl. 200-159.00R.

Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, to Swiss Aluminium Ltd. Apparatus for lowering the concentration of sodium in aluminum melts. 4,174,826, Cl. 266-227.000.

Buxmann, Kurt, to Swiss Aluminium Ltd. Process for the production of metal alloys. 4,174,965, Cl. 75-135.000.

B.V. Neratoom: *See—*
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C.B.R. Cementbedrijven N.V.: *See—*
Wolfs, Andreas G. J.; and Goessens, Lambertus H., 4,174,961, Cl. 75-30.000.

C. E. Equipment Co., Inc.: *See—*
Tatum, Joe F.; and Lewis, Thomas H., 4,175,021, Cl. 204-196.000.

C.G.R. Ultrasonic: *See—*
Dory, Jacques, 4,174,634, Cl. 73-606.000.

Cadillac Cage Company: *See—*
Appelblatt, Irving, 4,174,653, Cl. 89-36.00H.

Callet, Robert; and Jeantet, Henri, to Societe Anonyme des Imprimerie et Papeterie de l'Est. Bagging machine for packaging powdered materials. 4,174,599, Cl. 53-512.000.

Calspan Corporation: *See—*
DePalma, Vito A.; and Baier, Robert E., 4,175,233, Cl. 250-343.000.

Campbell, Joseph M., to Teledyne Industries, Inc. Method and apparatus for recording digital signals for actuating solenoid. 4,174,652, Cl. 84-1.280.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Armstrong, William A.; and Powell, Peter J., 4,175,168, Cl. 429-229.000.

Canadian General Electric Company Limited: *See—*
Brinkhof, Joseph B.; and Datt, Raymond R., 4,175,229, Cl. 219-208.000.

Canadian Tag & Label Ltd.: *See—*
Koza, John R., 4,174,857, Cl. 283-6.000.

Candor, James T. Method of storing solar energy. 4,174,979, Cl. 136-206.000.

Cannell, David S.; Giglio, Marzio; Benedek, George B.; von Schulthess, Gustav K.; and Cohen, Richard J., to Massachusetts Institute of Technology. Immunoassay by light scattering intensity anisotropy measurements. 4,174,952, Cl. 23-230.00B.

Canon, Inc.: *See—*
Hunn, Hans; and Schwarz, Georg, 4,174,888, Cl. 352-170.000.

Canon Kabushiki Kaisha: *See—*
Imataki, Hiroyuki; Toma, Hitoshi; and Narita, Noboru, 4,174,883, Cl. 350-126.000.
Murata, Shinji; and Iwaya, Toshio, 4,175,231, Cl. 250-227.000.

Canup, Robert E., to Texaco Inc. AC type ignition system with two time delay circuits. 4,174,695, Cl. 123-148.00E.

Carcia, Peter P.: *See—*
Burgarella, John P.; and Carcia, Peter P., 4,174,893, Cl. 354-29.000.

Carduck, Franz-Josef; Klotzer, Dietrich; Schneider, Werner; and Wust, Willi, to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA). Shaped washing agents having a mosaic-like structure and process. 4,175,050, Cl. 252-91.000.

Carl Hurth Maschinen- und Zahnradfabrik: *See—*
Hirt, Manfred, 4,174,771, Cl. 192-58.00B.

Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., to Pharmacia Fine Chemicals AB. Reactive derivatives of HS-group-containing polymers. 4,175,073, Cl. 260-112.00R.

Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., to UOP Inc. Polymeric materials containing semiconducting refractory oxides. 4,175,152, Cl. 428-242.000.

Carter, David C. M.: *See—*
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Casagrande, Bruno, to Casagrande & C. S.p.A. Batching plant for lime concrete. 4,174,788, Cl. 222-630.000.

Casagrande & C. S.p.A.: *See—*
Casagrande, Bruno, 4,174,788, Cl. 222-630.000.

Cassady, Henry W., Jr.: *See—*
Fleenor, Richard P.; and Cassady, Henry W., Jr., 4,174,722, Cl. 134-62.000.

Cassell, Ralph M., to Laclede Steel Company. Method of manufacturing springs, including the production of rod therefor. 4,174,981, Cl. 148-12.00B.

Castellano, Joseph C. Gunsight mount for Winchester rifle. 4,174,581, Cl. 42-1.0ST.

Caterpillar Tractor Co.: *See—*
Dezelan, Joseph E., 4,174,614, Cl. 60-445.000.
Frantzreb, John G., Sr.; and Weiss, C. David, 4,174,962, Cl. 75-53.000.
Hopkins, Donald L.; and Johnson, Gordon, 4,174,762, Cl. 180-6.440.
Stedman, Robert N., 4,174,757, Cl. 172-292.000.

Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, to Societe d'Etudes pour la Recuperation Electrolytique du Zinc. Apparatus for recovering zinc from residues. 4,175,027, Cl. 204-275.000.

Cellier, Francis, to Westinghouse Electric Corp. Remote nuclear green pellet processing apparatus. 4,174,938, Cl. 425-317.000.

CGEE Alsthom: *See—*
Debaigt, Jean, 4,174,878, Cl. 339-198.00R.

Chalmers, John H., Jr.: *See—*
Zimmerman, Sheldon B.; and Chalmers, John H., Jr., 4,175,007, Cl. 435-105.000.

Champion International Corporation: *See—*
Fogle, Ozzie; and Cooley, James, 4,175,161, Cl. 428-425.000.

Chandler, Richard N., to Schlumberger Technology Corporation. Nuclear magnetism logging method and system. 4,175,251, Cl. 324-303.000.

Charbonnages de France: *See—*
Delessard, Serge L.; and Puff, Roger M., 4,174,947, Cl. 432-15.000.

Chemische Werke Huls, A.G.: *See—*
Maahs, Gunther; and Rombusch, Konrad, 4,175,095, Cl. 260-544.00Y.

Chen, Nai Y.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Method for treatment of rubber and plastic wastes. 4,175,211, Cl. 585-241.000.

Chen, Stephen Y.; and Quinn, Thomas M., to Standard Oil Company. Titanium dioxide as a U.V. screen in fire retardant vinyl polymers. 4,175,071, Cl. 260-42.440.

Chen, William I., to Bell Telephone Laboratories, Incorporated. Regenerator having automatic gain control referenced to a data-pattern-dependent pulse stream. 4,175,213, Cl. 178-70.00R.

Chenoweth, Charles E. Rail draft vehicle employing tractor-like apparatus. 4,174,667, Cl. 105-26.00R.

Chepurnoi, Nikolai P.: *See—*
Kostylev, Alexandr D.; Chepurnoi, Nikolai P.; Plavskikh, Vladimir D.; and Cherednikov, Evgeny N., 4,174,758, Cl. 175-19.000.

Cherednikov, Evgeny N.: *See—*
Kostylev, Alexandr D.; Chepurnoi, Nikolai P.; Plavskikh, Vladimir D.; and Cherednikov, Evgeny N., 4,174,758, Cl. 175-19.000.

Chevron Research Company: *See—*
Wilgus, Donovan R.; and King, John M., 4,175,044, Cl. 252-42.700.

Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., to Bell Telephone Laboratories, Incorporated. Fe-Cr-Co magnetic alloy processing. 4,174,983, Cl. 148-102.000.

Chivas Products Ltd.: *See—*
Moore, Ronald D.; and Bethel, Everett L., 4,174,988, Cl. 156-213.000.

Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing n-chloroimides. 4,175,082, Cl. 260-326.00C.

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Mal, M. Kumar; and Tarkan, Stuart E., 4,174,967, Cl. 75-237.000.

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Bagga, Madan M.; and Moss, Noel S., 4,175,173, Cl. 528-97.000.
Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., 4,174,856, Cl. 282-27.500.
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Miller, Ralph, 4,175,116, Cl. 423-500.000.

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Rhyan, William C., 4,174,866, Cl. 297-194.000.

Clarke, John T.; Luck, Allan J.; and Sutton, Roger F., to Masonite Corporation. Post press molding of man-made boards to produce contoured furniture parts. 4,175,106, Cl. 264-118.000.

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CMI Corporation: *See—*
Swisher, George W., Jr., 4,174,949, Cl. 432-58.000.

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Argade, Shyam D.; and Coker, Thomas G., 4,175,023, Cl. 204-252.000.

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Collins, Thomas W., to International Business Machines Corporation. Serrated Y-bar magnetic bubble switch. 4,175,289, Cl. 365-15.000.

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Mitchell, Robert D.; and Schulz, Albert C., 4,174,933, Cl. 425-79.000.

Compton, Leslie E., to Occidental Oil Shale, Inc. Method of breaking shale oil-water emulsion. 4,174,751, Cl. 166-256.000.
Comstock, George W., Jr. Black board line marking device. 4,174,573, Cl. 33-32.00C.
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Wassermann, Martin; Noweck, Klaus; and Meyer, Arnold, 4,175,118, Cl. 423-628.000.
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Conrad, Robert A.: *See—*
Thompson, Gerald L.; Paschal, Gloria C.; and Conrad, Robert A., 4,175,080, Cl. 260-244.400.
Continental Oil Company: *See—*
Sammons, John K.; and Fox, Charles H., Jr., 4,175,040, Cl. 210-78.000.
Cooley, James: *See—*
Fogle, Ozzie; and Cooley, James, 4,175,161, Cl. 428-425.000.
Cooper, Eric G.: *See—*
Beuchel, Peter H.; and Cooper, Eric G., 4,175,003, Cl. 176-76.000.
Cooper Industries, Inc.: *See—*
Klemm, Robert W., 4,175,247, Cl. 318-466.000.
Senior, Robert B.; and Yarbrough, Paul A., 4,174,560, Cl. 29-566.100.
Copal Company Limited: *See—*
Matsumoto, Kunio, 4,174,897, Cl. 354-133.000.
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Lindstrom, Ivan T., 4,174,927, Cl. 417-372.000.
Copeland, William M.: *See—*
Shallenberg, Robert L.; Hufton, Austen B.; Blomgren, Roland A.; and Copeland, William M., 4,174,977, Cl. 134-6.000.
Copelin, Harry B., to Du Pont de Nemours, E. I., and Company. Separation of alcohol from tetrahydrofuran. 4,175,009, Cl. 203-96.000.
Corbett, James P. Temperature compensated oscillating crystal force transducer systems. 4,175,243, Cl. 310-338.000.
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Fessler, Herman S., 4,174,872, Cl. 312-290.000.
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Payton, Alan J., 4,175,028, Cl. 204-296.000.
Cosgrove, James F.: *See—*
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Dansac, Jean; and Couderc, Georges, 4,175,285, Cl. 364-456.000.
Courbot, Pierre, to Societe Anonyme D.B.A. Drum brake. 4,174,770, Cl. 188-79.50P.
Cousin, Alain, to U.S. Philips Corporation. Record player with start-stop control by means of a magnetic field. 4,174,841, Cl. 274-1.00L.
Cox, James H. Ship's propeller shaft sealing assembly. 4,174,672, Cl. 115-74.000.
Cragoe, Edward J., Jr.; and Bicking, John B., to Merck & Co., Inc. Interphenylene 11,12-secoprostaglandins. 4,175,203, Cl. 560-55.000.
Crane Packing Company: *See—*
Zobens, Arthur, 4,174,844, Cl. 277-85.000.
CRC-Crose International, Inc.: *See—*
Sims, Eugene F.; and Dierlam, Trueman, 4,175,224, Cl. 219-60.00R.
Creadh, Joseph P., III: *See—*
Lusk, Edwin B.; Riley, Douglas C., Jr.; and Creadh, Joseph P., III, 4,175,112, Cl. 423-242.000.
Creamer, Edward D.; and Krumpelt, Michael, to BASF Wyandotte Corporation. Sealed membrane filter press electrolytic cells. 4,175,025, Cl. 204-253.000.
Credelle, Thomas L.; and Spong, Fred W., to RCA Corporation. Recording a synthetic focused-image hologram on a thermally deformable plastic. 4,174,881, Cl. 350-3.630.
Crest Circle, Inc.: *See—*
Boles, Richard J., 4,174,747, Cl. 150-1.50R.
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Yu, Peter H., to AMAX Inc. Cathodic dissolution of cobaltic hydroxide. 4,175,014, Cl. 204-130.000.
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Curchod, Donald B., to Nortron Corporation. Scale construction. 4,174,760, Cl. 177-211.000.
Curtiss, Richard A. Weight control game apparatus. 4,174,840, Cl. 273-248.000.
Cuza, Cerso R. Device to separate liquids and solids in a mixture. 4,174,660, Cl. 99-495.000.
d'Agnolo, Armando, to Officine Savio S.p.A. System for the temporary storage of yarn. 4,174,799, Cl. 226-7.000.
Daharsh, Lonnie J. Bathroom planter box. 4,174,589, Cl. 47-66.000.
Dahms, Francis A., to Emhart Industries, Inc. Apparatus for straight line shearing. 4,174,647, Cl. 83-58.000.
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Gotz, Hans, 4,174,863, Cl. 296-1.00S.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Takita, Nobuhiro; and Shintani, Tadashi, 4,174,901, Cl. 354-322.000.
Daly, Thomas W.; Hoer, Ralph A.; Walsh, James E.; and James, Henry T., to Ralston Purina Company. Method for the manufacture of water soluble adhesives. 4,174,975, Cl. 106-161.000.
Dammar, Raymon H., to Possis Corporation. Apparatus for winding armatures. 4,174,815, Cl. 242-7.05B.
Dansac, Jean; and Couderc, Georges, to Thomson-CSF. Navigational system of high-speed aircraft. 4,175,285, Cl. 364-456.000.
Darlington, William B., to PPG Industries, Inc. Electrolytic cell membrane sealing means. 4,175,024, Cl. 204-252.000.
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Brinkhof, Joseph B.; and Datt, Raymond R., 4,175,229, Cl. 219-208.000.
Davies, Evan E.; and Kolombos, Alexander J., to British Petroleum Company Limited, The. Zeolite composition. 4,175,057, Cl. 252-455.00Z.
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Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000.
Davis, David L.: *See—*
Nelson, Alfred M.; and Davis, David L., 4,175,265, Cl. 346-74.100.
Davis, Jacob A.: *See—*
Sanders, Thomas J.; Morcom, William R.; and Davis, Jacob A., 4,174,562, Cl. 29-578.000.
Davis, Royston H.; and Searle, Robert J. G., to Shell Oil Company. Phenoxybenzyl ester pesticides. 4,175,134, Cl. 424-301.000.
Dayco Corporation: *See—*
Meadows, Roger D., 4,174,984, Cl. 156-143.000.
Debaigt, Jean, to CGEE Alsthom. Security structure for positioning a clip on a connector tab. 4,174,878, Cl. 339-198.00R.
De Boel, Marcel; Baudin, Pol; Wasterlain, Michel; and Collignon, Pierre, to BFG Glassgroup. Method of manufacturing a laminated, light transmitting, fire screening panel. 4,175,162, Cl. 428-428.000.
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Kusebauch, Walter; Kostka, Hana; Henkel, Hans-Joachim; Koch, Christian; de Bucs, Eugen S.; and Weber, Theo, 4,174,954, Cl. 48-212.000.
Decker, Heinz: *See—*
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.
Decor, Jean-Pierre, to Rhone-Poulenc Industries. Process for the preparation of vitamin A from sulphones. 4,175,205, Cl. 560-260.000.
Degrassi, Alfieri: *See—*
Bollen, Philip S.; and Degrassi, Alfieri, 4,175,147, Cl. 428-35.000.
De Haai, Kermit M. Self-propelled disk harrow machine. 4,174,756, Cl. 172-55.000.
Deibele GmbH & Co.: *See—*
Deibele, Manfred, 4,174,596, Cl. 52-202.000.
Deibele, Manfred, to Deibele GmbH & Co. Detachable insulating cover assembly for greenhouses and the like. 4,174,596, Cl. 52-202.000.
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DeMarco, Thomas M.: *See—*
Dupre, George T.; and DeMarco, Thomas M., 4,174,591, Cl. 51-16.000.
De Martino, Aldo. Stick-propelled disk game. 4,174,834, Cl. 273-96.00B.
De Nardo, John M. Apparatus for pneumatically applying material to an object. 4,174,868, Cl. 406-76.000.
Denjean, Rene, to Air Industrie. Heat-exchanger with rotor having radial passages. 4,174,748, Cl. 165-5.000.
Denki Onkyo Co., Ltd.: *See—*
Sawada, Eiji, 4,175,261, Cl. 335-210.000.
Dentron, Inc.: *See—*
Gallant, Ben J., 4,174,571, Cl. 433-216.000.
DePalma, Vito A.; and Baier, Robert E., to Calspan Corporation. Flow cell and method for continuously monitoring deposits on flow surfaces. 4,175,233, Cl. 250-343.000.
Descarsin, Marie-Therese: *See—*
Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000.
Deshmukh, Arvind D. Serum-soluble cholesterol compounds and method for their preparation. 4,175,074, Cl. 260-121.000.
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Sutton, Christopher J.; and Trigg, Leonard, 4,174,823, Cl. 248-582.000.
Dessau, Ralph M.: *See—*
Heiba, El Ahmadi I.; and Dessau, Ralph M., 4,175,089, Cl. 260-343.600.
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Knox, Harold L., 4,174,920, Cl. 414-160.000.
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Beschke, Helmut; Friedrich, Heinz; and Offermanns, Heribert, 4,175,195, Cl. 546-250.000.
Kleemann, Axel; Kiel, Reinhold; and Nubert, Ingomar, 4,175,088, Cl. 549-59.000.
Klenk, Herbert; Schwarze, Werner; and Leuchtenberger, Wolfgang, 4,175,188, Cl. 544-182.000.
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Ayers, John S., 4,175,183, Cl. 536-57.000.
Dezelan, Joseph E., to Caterpillar Tractor Co. Torque limiting control for front wheel drive. 4,174,614, Cl. 60-445.000.
Dickinson, Thorn W., to Textron Inc. Traction-drive transmission. 4,174,640, Cl. 74-690.000.
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Gelsdorf, Gunter; and Wirth, Friedhelm, 4,174,970, Cl. 106-44.000.
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Director-General of the Agency of Industrial Science and Technology: *See—*
Mizukami, Fujio; and Imamura, Juichi, 4,175,098, Cl. 260-590.0FA.

Disch, Karlheinz; and Kiewert, Eva, to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA). Aqueous cleanser compositions. 4,175,062, Cl. 252-540.000.

Divisek, Jiri: *See—*
Barnert, Heiko; Divisek, Jiri; and Faul, Wolfgang, 4,175,013, Cl. 204-129.000.

Dmitriev, Jury A.: *See—*
Kovalsky, Georgy A.; Maishev, Jury P.; Egorov, Boris A.; and Dmitriev, Jury A., 4,175,029, Cl. 204-298.000.

Dobo, Emerick J.; and Graham, Tommy E., to Monsanto Company. Inorganic anisotropic hollow fibers. 4,175,153, Cl. 428-398.000.

Dobrosielski, Stephen S.: *See—*
Johnston, Robert J.; Layciak, Stephen G.; and Dobrosielski, Stephen S., 4,175,220, Cl. 200-4.000.

Dolikian, Arman V., to Motorola, Inc. Dynamic threshold tone detector. 4,175,256, Cl. 328-149.000.

Dombrowski, Irvin R. Fan or wheel pulling device. 4,174,558, Cl. 29-259.000.

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Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

Dory, Jacques, to C.G.R. Ultrasonic. Echographic device for the real-time display of internal discontinuities of a test object. 4,174,634, Cl. 73-606.000.

Douglas, Peter E.: *See—*
Richards, Gordon S.; Douglas, Peter E.; and Abraham, Alan G., 4,175,230, Cl. 250-199.000.

Douwes International B.V.: *See—*
Jansen, Adolf E., 4,174,632, Cl. 73-422.00R.

Doveinis, Juozas, to General Motors Corporation. Window regulator mechanism. 4,174,865, Cl. 296-146.000.

Dow Chemical Company, The: *See—*
Harris, Robert F.; and Wagener, Earl H., 4,175,196, Cl. 546-339.000.

Drake, Jeffrey P. Extensible lock mechanism. 4,174,861, Cl. 292-269.000.

Dresser Industries, Inc.: *See—*
Richardson, Victor E., 4,174,848, Cl. 279-19.500.

Drevin, Hakan N. Y.: *See—*
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., 4,175,073, Cl. 260-112.00R.

Drews, Ulrich; and Singer, Erich, to Robert Bosch GmbH. Auxiliary fuel injection control circuit. 4,174,682, Cl. 123-32.0EE.

Drinkwaard, Adriana, nee Goossen, personal representative: *See—*
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased, 4,174,628, Cl. 73-151.000.

Drinkwaard, Willem, deceased: *See—*
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Driscoll, Patrick R., to Mobil Oil Corporation. 5-Substituted thiadiazole ureas. 4,175,081, Cl. 548-140.000.

Driskill, Roger D., to General Electric Company. Extrusion apparatus for producing elongated core members covered with concentric coatings. 4,174,935, Cl. 425-113.000.

Drnevich, Raymond F.; Venkataraman, Kallidaikurichi N.; and Walder, Thomas E., to Union Carbide Corporation. Apparatus for degassing floating sludge. 4,175,041, Cl. 210-188.000.

Drouzy, Michel L.; Richard, Michel M.; Huet, Francois P.; and Lacau, Henri M. Nonfibrous castable refractory concrete having high deflection temperature and high compressive strength and process. 4,174,972, Cl. 106-64.000.

Dudin, Jury A.: *See—*
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Duffey, Donn W., to Rockwell International Corporation. Valve actuator. 4,174,656, Cl. 92-134.000.

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Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,175,136, Cl. 424-330.000.

Dunn, Richard P. Plumber's appliance for clearing drains. 4,174,548, Cl. 15-104.3SN.

Dupin, Jean G. A., to Societe Anonyme Automobiles Citroen. In-line two-cylinder engine. 4,174,698, Cl. 123-192.00B.

Du Pont de Nemours, E. I., and Company: *See—*
Copelin, Harry B., 4,175,009, Cl. 203-96.000.

Dupre, George T.; and DeMarco, Thomas M., to NFE International Ltd. Apparatus for cleaning sand cores. 4,174,591, Cl. 51-16.000.

E. R. Squibb & Sons, Inc.: *See—*
Ondetti, Miguel A.; and Weisenborn, Frank L., 4,175,199, Cl. 548-336.000.

Eastman Kodak Company: *See—*
DiFrancesco, Alphonse B.; and Hage, Charles T., 4,174,905, Cl. 355-14.00R.

Eaton Corporation: *See—*
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Edwards, Grant C.; Vaughan, David E. W.; and Albers, Edwin W., to W. R. Grace & Co. Method of preparing a novel platelet-type crystalline form of synthetic faujasite. 4,175,059, Cl. 252-455.00Z.

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Wolfs, Andreas G. J.; and Goessens, Lambertus H., 4,174,961, Cl. 75-30.000.

Egorov, Boris A.: *See—*
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Eickel, Rolf: *See—*
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Eidsmore, Alva A.: *See—*
Eidsmore, Paul G.; and Eidsmore, Alva A., 4,174,733, Cl. 137-552.000.

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Eisai Co., Ltd.: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Inai, Yuichi; Igarashi, Toshiji; Nakajima, Yoshikage; and Eisai Co., Ltd., 4,175,139, Cl. 424-343.000.

Electromatic Drive Corporation: *See—*
Hillman, Darrel D., 4,174,641, Cl. 74-230.17A.

Electroosmosis Inc.: *See—*
Peterson, Earl C., 4,174,912, Cl. 404-27.000.

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Kempa, Bernd-Joachim, 4,174,820, Cl. 246-430.000.

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Abdulla, Riaz F.; and Fuhr, Kenneth H., 4,175,087, Cl. 260-586.00R.
Chou, Ta-Sen, 4,175,082, Cl. 260-326.00C.
Hatfield, Lowell D., 4,175,076, Cl. 260-239.00A.
Huffman, George W., 4,175,125, Cl. 424-246.000.
McKnight, Hugh P.; and Welty, Kenneth B., 4,174,775, Cl. 198-397.000.
Neuss, Norbert; and Miller, Roger D., 4,174,772, Cl. 435-32.000.
Thompson, Gerald L.; Paschal, Gloria C.; and Conrad, Robert A., 4,175,080, Cl. 260-244.400.
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Elkay Manufacturing Company: *See—*
Arnold, Don C.; Silletti, Julio D.; Ritzenthaler, Richard L.; and Wilcox, Thomas J., 4,174,726, Cl. 137-100.000.

Elliott Brothers (London) Limited: *See—*
Glenn, Stephen J., 4,174,818, Cl. 244-3.130.

Elliott, Stanley B. Visual-type hygrometer. 4,175,207, Cl. 562-460.000.

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Enfield, Robert E.: *See—*
Fulks, Robert G.; Enfield, Robert E.; and Greenwood, Edward H., 4,174,805, Cl. 235-302.000.

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Adlhart, Otto J., 4,175,165, Cl. 429-30.000.

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Murasaki, Hiroshi; Enoguchi, Yuji; Wada, Kenichi; and Fujiwara, Takao, 4,174,904, Cl. 355-8.000.

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Erikson, Rolf B.: *See—*
Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,174,890, Cl. 353-26.00A.

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Lonseth, Wayne F., 4,175,281, Cl. 362-148.000.

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Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., to Molins Limited. Feeding cigarettes and similar rod-like articles. 4,174,780, Cl. 209-536.000.
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Fechter, Henry G., to Teletype Corporation. Making memory structure for laser recording system. 4,175,145, Cl. 427-240.000.
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Ferguson, Sammy J.; and Yohe, William R., to Recognition Equipment Incorporated. Severing and sealing tool. 4,174,995, Cl. 156-494.000.
Fermaglich, Saul; and Volent, Ivan. Apparatus for producing multiple image formats. 4,174,895, Cl. 354-76.000.
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Fisher, Johnny D. Washer/separator system for drilling cuttings in water environment oil wells. 4,175,039, Cl. 210-74.000.
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Fleenor, Richard P.; and Cassady, Henry W., Jr., to Manning Environmental Corp. Cleaning apparatus for sample containers in a queue. 4,174,722, Cl. 134-62.000.
Fleming, James W., Jr.; O'Bryan, Henry M., Jr.; and Thomson, John, Jr., to Bell Telephone Laboratories, Incorporated. Composition and processing procedure for making thermistors. 4,175,060, Cl. 252-518.000.
Flint, John R.; and Rady, Bruce A., to Bell & Howell Company. Microfilm reader/printer. 4,174,891, Cl. 353-26.00A.
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Foederer, Wilhelmus T. Connector for flat cable. 4,174,877, Cl. 339-97.00P.
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Fondriest, F. Frederick, to Standard Oil Company (Indiana). Process for converting coal ash slag into portland cement. 4,174,974, Cl. 106-103.000.
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Franch, Gino. Hydraulic machine. 4,174,611, Cl. 60-325.000.
Frank, Karl, to Agfa-Gevaert Aktiengesellschaft. Photographic reversal process without second exposure. 4,174,968, Cl. 430-375.000.
Franklin, Edna M. Drapery tieback ring holding clip. 4,174,552, Cl. 24-73.0CH.
Frantzreb, John G., Sr.; and Weiss, C. David, to Caterpillar Tractor Co. Filled tubular article for controlled insertion into molten metal. 4,174,962, Cl. 75-53.000.
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Freese, Lennart W., to SMT-Pullmax AB. Flow sensing valve for protecting conduit systems against unintentional pressure changes. 4,174,732, Cl. 137-498.000.
Fried, Josef, to University of Chicago. Chemical synthesis. 4,175,201, Cl. 560-17.000.
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Fuhrmann, Wolfgang, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Braking device for four-stroke cycle reciprocating piston internal combustion engine. 4,174,687, Cl. 123-90.130.
Fuji Kogyo Co., Ltd.: *See*—
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Fujii, Takashi; and Kizaki, Jiro, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Seal member for connecting master cylinder and reservoir. 4,174,786, Cl. 220-378.000.
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Fujii, Toshihiro; and Yokota, Sekiji, to Hayakawa Rubber Company Limited. Water proofing compositions for cement mortar or concrete and methods of application therefor. 4,174,993, Cl. 156-244.110.
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Fuqua, Dale: *See—*
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Gale, Glen R.; and Meischen, Sandra J., to United States of America, America. 1,2-Diaminocyclohexane platinum (II) complexes having antineoplastic activity against L1210 leukemia. 4,175,133, Cl. 424-287.000.
Gallant, Ben J., to Dentron, Inc. Method for cleaning teeth. 4,174,571, Cl. 433-216.000.
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Glass, Neel W., to Les-Kare, Inc. Adjustable boot type composition horseshoe. 4,174,754, Cl. 168-18.000.
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Guillermin, Rene; Joly, Jean; and Sangalli, Silvio, to Rhone-Poulenc Textile. Process for texturizing polyester yarn and yarn. 4,175,157, Cl. 428-369.000.
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Harakawa, Mototaka; and Mitumori, Yoshio, to Star Seimitsu Kabushiki Kaisha. Buzzer with rigid electrical leads. 4,175,262, Cl. 340-388.000.
Harari, Eliyahou, to Hughes Aircraft Company. Integrated semiconductor memory array having improved logic latch circuitry. 4,175,290, Cl. 365-156.000.
Hardy, Steven S.: *See—*
Holland, Charles L.; and Hardy, Steven S., 4,174,801, Cl. 227-4.000.
Hargett, Jerry D.; and Nash, Alfred C. Electrical connector for a vehicle. 4,174,873, Cl. 339-10.000.
Harnessed Energies, Inc.: *See—*
Lewis, John R., 4,174,577, Cl. 33-302.000.
Harrington Manufacturing Co.: *See—*
Griffin, J. Curtis, 4,174,601, Cl. 56-27.500.
Harris Corporation: *See—*
Sanders, Thomas J.; Morcom, William R.; and Davis, Jacob A., 4,174,562, Cl. 29-578.000.
Harris, Robert F.; and Wagener, Earl H., to Dow Chemical Company, The. Certain pyridinium surfactants. 4,175,196, Cl. 546-339.000.
Harris, Robert R.; and Pollack, Warren J., to International Minerals & Chemical Corporation. Resinous product. 4,175,063, Cl. 260-22.00R.
Harstead, Gunnar A. Component nuclear containment structure. 4,175,005, Cl. 176-87.000.
Hart, Richard K. Fender flare clip apparatus. 4,174,850, Cl. 280-153.00R.
Hartung, Philip F. Anti-collapse cap. 4,174,784, Cl. 215-349.000.
Harvey, Robert M.: *See—*
Shrontz, Michael J.; and Harvey, Robert M., 4,174,803, Cl. 229-15.000.
Hasco-Normalien Hasenclever & Co.: *See—*
Fenner, Klaus-Bernd, 4,174,939, Cl. 425-451.900.
Hasegawa, Hisashi: *See—*
Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; Takeuchi, Takashi; Moriyama, Noboru; and Fukuyama, Yukihiro, 4,175,066, Cl. 260-29.60M.
Hashizume, Hikaru: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Watanabe, Hironori; Kondo, Tatsunori; Kugisawa, Toshio; and Washiyama, Yutaka, 4,174,649, Cl. 84-1.010.
Hasson, Harrith M. Multi-pronged laparoscopy forceps. 4,174,715, Cl. 128-321.000.
Hatfield, Lowell D., to Eli Lilly and Company. Azetidinone mercury sulfides and process therefor. 4,175,076, Cl. 260-239.00A.
Hawera Probst GmbH & Co.: *See—*
Peetz, Wolfgang; Scheuch, Anton; and Muller, Walter, 4,174,915, Cl. 407-59.000.
Hawkins, Harold G.; and Rodondi, Andrew F., to General Motors Corporation. Spade terminal. 4,174,880, Cl. 339-217.00S.
Hayakawa Rubber Company Limited: *See—*
Fujii, Toshihiro; and Yokota, Sekiji, 4,174,992, Cl. 156-244.110.
Fujii, Toshihiro; and Yokota, Sekiji, 4,174,993, Cl. 156-244.110.
Hechler, Valentine, IV. Jet pump proportioners. 4,174,812, Cl. 239-318.000.
Heck, Richard F., to University of Delaware. Process for the preparation of tertiary allylic amines from vinylic halides and olefins. 4,175,187, Cl. 544-170.000.
Hedman, Jonathan W.: *See—*
Blackmer, Richard H.; and Hedman, Jonathan W., 4,174,955, Cl. 55-158.000.
Heiba, El Ahmadi I.; and Dessau, Ralph M., to Mobil Oil Corporation. Preparation of gamma-butyrolactones. 4,175,089, Cl. 260-343.600.
Heilmann, Roland, to J. Lorch Gesselschaft & Co. KG. Housing for air service units. 4,174,730, Cl. 137-271.000.
Heintz, Frieder: *See—*
Zabler, Erich; Jansche, Walter; and Heintz, Frieder, 4,174,638, Cl. 73-728.000.
Hendriksen, Barry A., to Lilly Industries Limited. Pesticidal formulation. 4,174,960, Cl. 71-121.000.
Henkel Corporation: *See—*
MacKay, Kenneth D.; and Rogier, Edgar R., 4,175,012, Cl. 204-108.000.
Henkel, Hans-Joachim: *See—*
Kusebauch, Walter; Kostka, Hana; Henkel, Hans-Joachim; Koch, Christian; de Bucs, Eugen S.; and Weber, Theo, 4,174,954, Cl. 48-212.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA): *See—*
Carduck, Franz-Josef; Klotzer, Dietrich; Schneider, Werner; and Wust, Willi, 4,175,050, Cl. 252-91.000.
Disch, Karlheinz; and Kiewert, Eva, 4,175,062, Cl. 252-540.000.
Hennig, Michael; and Reiner, Lawrence, to Mego Corp. Simulated road racing game. 4,174,833, Cl. 273-1.00E.
Herbert Meister and Co.: *See—*
Meister, Herbert, 4,174,990, Cl. 156-158.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing cyanamido or dicyanamido substituents. 4,175,181, Cl. 528-168.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,172, Cl. 528-27.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,174, Cl. 528-168.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,178, Cl. 528-373.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,179, Cl. 528-381.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,180, Cl. 528-399.000.
Herrington, F. John, to Mobil Oil Corporation. Apparatus for extruding tubular thermoplastic film. 4,174,932, Cl. 425-72.00R.
Herzig, Albert M.: *See—*
Beny, Janos; and Herzig, Albert M., 4,174,743, Cl. 141-18.000.
Herzog, Karl: *See—*
Binder, Siegfried; and Herzog, Karl, 4,174,811, Cl. 239-308.000.
Higginbottom, Lonnie C.: *See—*
Pfenning, Dwight B.; Higginbottom, Lonnie C.; and Sliepcevich, Cedomir M., 4,174,925, Cl. 417-225.000.
Hilfman, Lee, to UOP Inc. Hydroprocessing of hydrocarbons over nickel, moly, platinum catalyst. 4,175,033, Cl. 208-143.000.
Hill, Brian, to International Nickel Company, Inc., The. Production of ceramic powders for ferrite, spinel, titanate and garnet production. 4,175,117, Cl. 423-594.000.
Hill, Jere L.: *See—*
Swis, Philip E.; and Hill, Jere L., 4,174,627, Cl. 73-116.000.
Hillman, Darrel D., to Electromatic Drive Corporation. Power drive transmission assembly. 4,174,641, Cl. 74-230.17A.
Hipps, Larry W. Electro-hydraulic brake actuating system. 4,174,869, Cl. 303-10.000.
Hirai, Jun: *See—*
Numakura, Toshihiko; and Hirai, Jun, 4,175,272, Cl. 360-34.000.
Hiraide, Takashi: *See—*
Imamura, Tetsuya; Hiraide, Takashi; Arai, Haruhiko; and Hirakura, Megumu, 4,175,051, Cl. 252-91.000.
Hirakura, Megumu: *See—*
Imamura, Tetsuya; Hiraide, Takashi; Arai, Haruhiko; and Hirakura, Megumu, 4,175,051, Cl. 252-91.000.

Hirt, Manfred, to Carl Hurth Maschinen- und Zahnradfabrik. Friction clutch. 4,174,771, Cl. 192-58.00B.

Hirtreiter, Arthur B.; and Brown, Paul R., to Goodyear Tire & Rubber Company, The. Airsprings. 4,174,827, Cl. 267-65.00B.

Hitachi Cable, Ltd.: *See—*
Nagano, Hiroo; Ikeda, Chuki; Takahashi, Kenji; Kato, Naoyoshi; and Sato, Norio, 4,174,677, Cl. 118-67.000.

Hitachi, Ltd.: *See—*
Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro; and Oguro, Tomokatsu, 4,175,245, Cl. 315-39.710.
Ohta, Hirofumi; Futami, Toshio; and Umeyama, Kazuo, 4,175,288, Cl. 365-2.000.

Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Envelope generator for an electronics musical instrument. 4,174,650, Cl. 84-1.010.

Hoburg, James F.: *See—*
Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., 4,174,907, Cl. 366-279.000.

Hoch, Samuel: *See—*
Landau, Marvin; Bellettiere, Samuel J.; and Hoch, Samuel, 4,175,064, Cl. 260-22.0CA.

Hochleitner, Rudolf H.: *See—*
Eppich, Alfred; and Hochleitner, Rudolf H., 4,175,151, Cl. 428-202.000.

Hochtemperatur-Reaktorbau GmbH: *See—*
Haferkamp, Dirk; Hodzic, Alija; and Schneider, Karl-Uwe, 4,175,001, Cl. 176-60.000.

Hodzic, Alija: *See—*
Haferkamp, Dirk; Hodzic, Alija; and Schneider, Karl-Uwe, 4,175,001, Cl. 176-60.000.

Hoer, Ralph A.: *See—*
Daly, Thomas W.; Hoer, Ralph A.; Walsh, James E.; and James, Henry T., 4,174,975, Cl. 106-161.000.

Hoffman, Michael R.: *See—*
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,105, Cl. 264-112.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,148, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,149, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,150, Cl. 428-171.000.

Hoffmann-La Roche Inc.: *See—*
Binder, Dieter; Hromatka, Otto; Pfister, Rudolf; and Zeller, Paul, 4,175,085, Cl. 549-65.000.
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,175,086, Cl. 549-51.000.
Muller, Jean-Claude; and Ramuz, Henri, 4,175,189, Cl. 544-323.000.
Muller, Jean-Claude; and Ramuz, Henri, 4,175,190, Cl. 544-323.000.

Hogfors, Enar: *See—*
Bizzari, Venanzio; and Hogfors, Enar, 4,175,228, Cl. 219-153.000.

Holko, Kenneth H.; and Odell, John R., to General Atomic Company. Gas flow control circuit for plasma arc welding. 4,175,225, Cl. 219-121.00P.

Holland, Charles L.; and Hardy, Steven S., to General Dynamics Corporation. Hollow core panel insert installation device. 4,174,801, Cl. 227-4.000.

Hollis, Thomas J.; and Thornburgh, William F., to General Motors Corporation. Power cruise diverter valve. 4,174,610, Cl. 60-290.000.

Holt, William C., Jr.: *See—*
Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., 4,175,152, Cl. 428-242.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nakamura, Nagatoshi, 4,174,796, Cl. 224-39.000.

Honda, Makoto: *See—*
Ozawa, Kohe; Hosoya, Kazuhiro; Kurita, Jiro; and Honda, Makoto, 4,175,176, Cl. 526-309.000.

Honig, Guenther; Kiencke, Uwe; and Zechnall, Martin, to Robert Bosch GmbH. Digital-electronic engine ignition system. 4,174,688, Cl. 123-117.00D.

Hopkins, Donald L.; and Johnson, Gordon, to Caterpillar Tractor Co. Hydrostatic transmission with differential steering. 4,174,762, Cl. 180-6.440.

Hori, Osamu; and Kondo, Katsumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for surface treatment of electrode in distributor of internal combustion engine for suppressing noise. 4,175,144, Cl. 427-126.000.

Horii, Hideo: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,175,068, Cl. 260-31.2MR.

Horiike, Yasuhiro: *See—*
Niwa, Kazuo; Shibagaki, Masahiro; and Horiike, Yasuhiro, 4,175,235, Cl. 250-542.00ω.

Horodysky, Andrew G., to Mobil Oil Corporation. Metal salts of sulfurized olefin adducts of phosphorodithioic acids and organic compositions containing same. 4,175,043, Cl. 252-32.70E.

Hosaka, Akio, to Nissan Motor Company, Limited. Electronic closed loop air-fuel ratio control system. 4,174,689, Cl. 123-119.0EC.

Hosoya, Kazuhiro: *See—*
Ozawa, Kohe; Hosoya, Kazuhiro; Kurita, Jiro; and Honda, Makoto, 4,175,176, Cl. 526-309.000.

Houghton, James R. Container closure with compartment. 4,174,744, Cl. 141-98.000.

Houghton, Joseph. Conduit coupling assembly. 4,174,859, Cl. 285-111.000.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. 4-Phenyl isoquinolines. 4,175,191, Cl. 546-144.000.

House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., to Semicon, Inc. Method of fabricating high intensity solar energy converter. 4,174,561, Cl. 29-572.000.

Houseman, Kenneth R., to Litton Industrial Products, Inc. Electrolytic apparatus for recovering metal from solutions. 4,175,026, Cl. 204-272.000.

Howard, Charles R. Fishing lure. 4,174,584, Cl. 43-42.500.

Howard, Gordon H.: *See—*
Rasero, Lawrence J.; Pelchuck, John, Jr.; and Howard, Gordon H., 4,174,739, Cl. 139-388.000.

Howell, John K., Jr.; and Kulick, Leonard, to Oxy Metal Industries Corporation. Melamine-formaldehyde and tannin treatment of metal surfaces. 4,174,980, Cl. 148-6.14R.

Hoyt, Donald A.; and Fischer, Harold L., to Fulton Tool Co., Inc. Bottle testing apparatus. 4,174,633, Cl. 73-432.00R.

Hromatka, Otto: *See—*
Binder, Dieter; Hromatka, Otto; Pfister, Rudolf; and Zeller, Paul, 4,175,085, Cl. 549-65.000.

Hubble, David L., Sr.: *See—*
Shepherd, Patrick J.; and Hubble, David L., Sr., 4,174,598, Cl. 53-431.000.

Huet, Francois P.: *See—*
Drouzy, Michel L.; Richard, Michel M.; Huet, Francois P.; and Lacau, Henri M., 4,174,972, Cl. 106-64.000.

Huffman, George W., to Eli Lilly and Company. Method for treating methicillin resistant staphylococcus aureus. 4,175,125, Cl. 424-246.000.

Hufton, Austen B.: *See—*
Shallenberg, Robert L.; Hufton, Austen B.; Blomgren, Roland A.; and Copeland, William M., 4,174,977, Cl. 134-6.000.

Hughes Aircraft Company: *See—*
Harari, Eliyahou, 4,175,290, Cl. 365-156.000.

Hunn, Hans; and Schwarz, Georg, to Canon, Inc. Automatic film transport monitoring system. 4,174,888, Cl. 352-170.000.

Hunt, Donald F.; and Shabanowitz, Jeffrey, to University of Virginia. Apparatus for producing ions of thermally labile or nonvolatile solids. 4,175,234, Cl. 250-427.000.

Hunter, Arthur C.; and Norman, Lloyd E., to Texas Instruments Incorporated. Burn-in test system for electronic apparatus. 4,175,286, Cl. 364-737.000.

Hunter, Byron A.; and Barrows, Franklin H., to Uniroyal, Inc. N,N-Disubstituted sulfonyl hydrazines. 4,175,200, Cl. 560-1.000.

Hunter, John. Pipe jointing. 4,174,996, Cl. 156-499.000.

Hunyadi, Laszlo; Andersson, Leif; and Mansson, Martin, to Stal-Laval Turbin AB. Combustion chamber for a gas turbine. 4,174,608, Cl. 60-39.650.

Hupalowsky, Joseph, to Wm. Wrigley Jr. Company. Dispensing apparatus. 4,174,781, Cl. 211-49.00D.

Huret, Roger H. Bicycle frame support member. 4,174,851, Cl. 280-288.000.

Hurst, George H., Jr. Detent for mechanical linkage. 4,174,550, Cl. 16-144.000.

Hydrosoil Corporation: *See—*
Webb, Jack; and Schwartz, Stanley L., 4,174,957, Cl. 71-24.000.

Hyldon, Roy G.; and O'Mahony, John S., to Quaker Oats Company, The. Method of treating hypercholesterolemia. 4,175,124, Cl. 424-180.000.

Ichikawa, Kiyoshi: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,174,650, Cl. 84-1.010.

Igarashi, Toshiji: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Inai, Yuichi; Igarashi, Toshiji; Nakajima, Yoshikage; and Eisai Co., Ltd., 4,175,139, Cl. 424-343.000.

Ihara, Keiichi: *See—*
Kamoshida, Masakazu; and Ihara, Keiichi, 4,174,567, Cl. 29-741.000.

Iijima, Yaichi, to Konishiroku Photo Industry Co., Ltd. Camera. 4,174,898, Cl. 354-145.000.

Iizuka, Shigeo: *See—*
Nozawa, Takamitsu; Goto, Takayuki; Kishi, Takao; and Iizuka, Shigeo, 4,174,790, Cl. 222-321.000.

Ikeda, Chuki: *See—*
Nagano, Hiroo; Ikeda, Chuki; Takahashi, Kenji; Kato, Naoyoshi; and Sato, Norio, 4,174,677, Cl. 118-67.000.

Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, to Nippon Steel Corporation. Stainless steel products, such as sheets and pipes, having a surface layer with an excellent corrosion resistance and production methods therefor. 4,175,163, Cl. 428-553.000.

Ikins, Thomas G., to USM Corporation. Composite film adhesive. 4,175,156, Cl. 428-336.000.

Imai, Tamotsu, to UOP Inc. Catalytic composite for oxydehydrogenation of alkylaromatic hydrocarbons. 4,175,058, Cl. 252-455.00R.

Imamura, Juichi: *See—*
Mizukami, Fujio; and Imamura, Juichi, 4,175,098, Cl. 260-590.0FA.

Imamura, Tetsuya; Hiraide, Takashi; Arai, Haruhiko; and Hirakura, Megumu, to Kao Soap Co., Ltd. Scouring pad containing phosphoric acid ester-fatty acid soap mixtures. 4,175,051, Cl. 252-91.000.

Imataki, Hiroyuki; Toma, Hitoshi; and Narita, Noboru, to Canon Kabushiki Kaisha. Rear projection screen. 4,174,883, Cl. 350-126.000.

Immorlica, Anthony A., Jr., to Rockwell International Corporation. Capless annealing compound semiconductors. 4,174,982, Cl. 148-13.100.

Ina, Tatsuo, to Mitsuwa Shashin Kogyo Kabushiki Kaisha. Camera tripod. 4,174,900, Cl. 354-293.000.
Inai, Yuichi: *See*—
Kijima, Shizumasa; Yamatsu, Isao; Inai, Yuichi; Igarashi, Toshiji; Nakajima, Yoshikage; and Eisai Co., Ltd., 4,175,139, Cl. 424-343.000.
Inamura, Ichiro: *See*—
Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro; and Oguro, Tomokatsu, 4,175,245, Cl. 315-39.710.
Industrie Pirelli S.p.A.: *See*—
Pizzorno, Augusto, 4,174,940, Cl. 425-577.000.
Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See*—
Madlener, Paul, 4,174,665, Cl. 102-8.000.
Inland Container Corporation: *See*—
Shrontz, Michael J.; and Harvey, Robert M., 4,174,803, Cl. 229-15.000.
Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR: *See*—
Kostylev, Alexandr D.; Chepurnoi, Nikolai P.; Plavskikh, Vladimir D.; and Cherednikov, Evgeny N., 4,174,758, Cl. 175-19.000.
Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst: *See*—
Teodorescu, Constantin; and Ardeleanu, Stefan, 4,174,921, Cl. 414-387.000.
International Business Machines Corporation: *See*—
Collins, Thomas W., 4,175,289, Cl. 365-15.000.
Mulzet, Alfred P.; and Trudgen, Gary A., 4,174,637, Cl. 73-730.000.
Schaefer, Donald W., 4,175,275, Cl. 360-104.000.
International Harvester Company: *See*—
Cicci, George B.; and Segredo, John D., 4,174,600, Cl. 56-1.000.
Kuhn, Wolfgang, 4,174,615, Cl. 60-453.000.
International Minerals & Chemical Corporation: *See*—
Harris, Robert R.; and Pollack, Warren J., 4,175,063, Cl. 260-22.00R.
International Nickel Company, Inc., The: *See*—
Hill, Brian, 4,175,117, Cl. 423-594.000.
Shaw, Stuart W. K.; and Fontaine, Paul I., 4,174,964, Cl. 75-122.000.
International Standard Electric Corporation: *See*—
Richards, Gordon S.; Douglas, Peter E.; and Abraham, Alan G., 4,175,230, Cl. 250-199.000.
International Telephone & Telegraph Corporation: *See*—
Asaki, James T., 4,175,279, Cl. 362-18.000.
McCartney, Ronald L., 4,174,882, Cl. 350-96.210.
Williams, Roy K., 4,174,663, Cl. 100-53.000.
Internationella Siporex AB: *See*—
Goransson, Rolf E., 4,174,936, Cl. 425-297.000.
Irvin, Robert A.: *See*—
House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., 4,174,561, Cl. 29-572.000.
Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro; and Oguro, Tomokatsu, to Hitachi, Ltd. Magnetron magnet assembly. 4,175,245, Cl. 315-39.710.
Ishihara, Nobuhiko: *See*—
Senuma, Masaru; Ishihara, Nobuhiko; Nishimoto, Shigeru; Yamato, Eisaku; and Shigematsu, Noboru, 4,175,206, Cl. 562-444.000.
Ishii, Shigeki: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,174,650, Cl. 84-1.010.
Ishimaru, Toshiyasu: *See*—
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, 4,175,185, Cl. 544-28.000.
Ishizuka, Yutaka, to Diesel Kiki Company, Ltd. Vane for rotary compressor. 4,174,931, Cl. 418-259.000.
Isoz, Peter: *See*—
Linnman, Sven N. J.; Isoz, Peter; Branderud, Nils P.; and Udden, Per E. C., 4,175,255, Cl. 328-7.000.
Itek Corporation: *See*—
Robbins, Daniel H., 4,174,817, Cl. 242-57.000.
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, to Mitsui Toatsu Chemicals, Inc. Catalyst for polymerizing α-olefins. 4,175,171, Cl. 526-125.000.
Ito, Tateo; and Kaneko, Tomijiro, to Obata Industry & Commerce Co., Ltd. Method for improving the properties of natural products composed mainly of calcium carbonate. 4,175,146, Cl. 427-304.000.
ITT Industries, Inc.: *See*—
Oberthur, Heinrich, 4,174,867, Cl. 303-6.00C.
Iwao, Tetsuya: *See*—
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, 4,175,171, Cl. 526-125.000.
Iwaoka, Kazuo; Toh, Tagao; and Fukada, Minoru, to Matsushita Electric Industrial Co., Ltd. Catalytic exhaust gas purifying device. 4,175,107, Cl. 422-114.000.
Iwata, Kenji: *See*—
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, 4,175,171, Cl. 526-125.000.
Iwatsu Electric Co., Ltd.: *See*—
Kita, Gunzo; and Sekiguchi, Koichi, 4,175,216, Cl. 179-99.00A.
Iwaya, Toshio: *See*—
Murata, Shinji; and Iwaya, Toshio, 4,175,231, Cl. 250-227.000.
J.J. & M.: *See*—
Persik, James E.; and Persik, Gerald E., 4,174,559, Cl. 29-509.000.
J. Lorch Gesselschaft & Co. KG: *See*—
Heilmann, Roland, 4,174,730, Cl. 137-271.000.
Jabsen, Felix S., to Babcock & Wilcox Company, The. Method for inspecting nuclear reactor fuel elements. 4,175,000, Cl. 176-19.00R.
Jabsen, Felix S., to Babcock & Wilcox Company, The. Fuel assembly guide tube. 4,175,004, Cl. 176-76.000.
Jacko, Michael G.: *See*—
Klein, Bruce W.; and Jacko, Michael G., 4,175,070, Cl. 260-38.000.
Jackson, W. Shaun; and Bohm, Leslie E. Pannier mounting arrangement for cycles. 4,174,795, Cl. 224-32.00A.
Jahn, Gerhard. Loose leaf binder. 4,174,909, Cl. 402-13.000.
Jalali-Karchay, Mir Javid. Turbocharger control system. 4,174,617, Cl. 60-602.000.
Jalbert, Henry A., to United Technologies Corporation. Ceramic base and cap useful in firing ceramic shell molds. 4,174,950, Cl. 432-6.000.
James, David R.: *See*—
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,175,048, Cl. 252-63.500.
James, Henry T.: *See*—
Daly, Thomas W.; Hoer, Ralph A.; Walsh, James E.; and James, Henry T., 4,174,975, Cl. 106-161.000.
Janata, Jiri; and McBride, Paul T., to University of Utah. Method of sterilizing reference electrodes and the like. 4,175,020, Cl. 204-195.00B.
Jankelson, Bernard; and Radke, John C., to Jankelson, Bernard. 4,5,6-Trinor-3,7-inter-m-phenylene prostaglandin A_1 analogs. 4,174,706, Cl. 128-741.000.
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Joseph, Bernard W.; and Gara, Aaron D., to General Motors Corporation. Filter rotator for coherent optical correlation system. 4,174,885, Cl. 350-162.05SF.
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Juvinall, Jonn W., to Owens-Illinois, Inc. Method and apparatus of cavity identification of mold of origin. 4,175,236, Cl. 250-566.000.
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Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Watanabe, Hironori; Kondo, Tatsunori; Kugisawa, Toshio; and Washiyama, Yutaka, 4,174,649, Cl. 84-1.010.
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Nakata, Kiyohiro, 4,174,575, Cl. 33-164.00R.
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Imamura, Tetsuya; Hiraide, Takashi; Arai, Haruhiko; and Hirakura, Megumu, 4,175,051, Cl. 252-91.000.
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Kasper, Erich, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Process for automatically vertically butt welding steel sheet material for containers. 4,175,227, Cl. 219-125.120.

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Nagano, Hiroo; Ikeda, Chuki; Takahashi, Kenji; Kato, Naoyoshi; and Sato, Norio, 4,174,677, Cl. 118-67.000.

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Kellogg, Walter J., to Westinghouse Electric Corp. Convertible selector switch. 4,175,221, Cl. 200-4.000.

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Kempa, Bernd-Joachim, to Elektro-Thermit GmbH. Method for moving a railway switch and equipment for implementing the method. 4,174,820, Cl. 246-430.000.

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Kiewert, Eva: *See—*
Disch, Karlheinz; and Kiewert, Eva, 4,175,062, Cl. 252-540.000.

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Smith, Arthur W.; and Kimble, George D., 4,174,807, Cl. 236-47.000.

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Bakker, Pieter M.; and Kind, Cornelis E., 4,175,092, Cl. 260-456.00R.

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Kispert, Klaus; Manger, Werner; and Weineck, Paul, to SKF Industrial Trading & Development Company B.V. Multi-part antifriction bearing cage. 4,174,870, Cl. 308-217.000.

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Fujii, Takashi; and Kizaki, Jiro, 4,174,786, Cl. 220-378.000.

Kleemann, Axel; Kiel, Reinhold; and Nubert, Ingomar, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of [1,1-dithienyl-(3)-1-hydroxypropyl-(3)]-[1-phenyl-1-hydroxypropyl-(2)]-amine and [1,1-dithienyl-(3)-propen-(1)-yl-(3)]-[1-phenylpropyl-(2)]-amine. 4,175,088, Cl. 549-59.000.

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Klemm, Robert W., to Cooper Industries, Inc. Electric motor control for conductor wrapping tool. 4,175,247, Cl. 318-466.000.

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Klomp, Franciscus M.; and van Kruijsdijk, Josephus H., to U.S. Philips Corporation. Package for tubular lamp. 4,174,778, Cl. 206-303.000.

Klotzer, Dietrich: *See—*
Carduck, Franz-Josef; Klotzer, Dietrich; Schneider, Werner; and Wust, Willi, 4,175,050, Cl. 252-91.000.

Klusmier, Kenneth L., to Morgan Construction Company. Hexagonal bundle forming apparatus. 4,174,662, Cl. 100-7.000.

Knapp, Heinrich: *See—*
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Bradley, Robert O.; Knighton, Heywood J.; and Naveaux, Robert J., 4,174,948, Cl. 432-54.000.

Knollmueller, Karl O., to Olin Corporation. Functional fluid methods using alkoxysilane ester cluster compounds. 4,175,049, Cl. 252-78.300.

Knopp, Ingolf, to Gustav Wagner Maschinenfabrik. Holder for a tangential chasing tool. 4,174,919, Cl. 408-151.000.

Knox, Harold L., to Detroit Stoker Company. Solid fuel distributor. 4,174,920, Cl. 414-160.000.

Kobayashi, Toshio: *See—*
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.

Koch, Christian: *See—*
Kusebauch, Walter; Kostka, Hana; Henkel, Hans-Joachim; Koch, Christian; de Bucs, Eugen S.; and Weber, Theo, 4,174,954, Cl. 48-212.000.

Koel, Gerrit J.; and Gerkema, Jan, to U.S. Philips Corporation. Method of reinforcing a conductive base pattern by electroplating and device obtained by means of the method. 4,175,010, Cl. 204-15.000.

Kokin, Vilyam N.: *See—*
Kremlev, Vyacheslav Y.; Nazarian, Artashes R.; Lubashevsky, Alexei V.; and Kokin, Vilyam N., 4,175,240, Cl. 307-205.000.

Kolk, Erich: *See—*
Schweier, Guenther; Bachl, Robert; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gruber, Wolfgang; and Kolk, Erich, 4,175,170, Cl. 526-125.000.

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Kolze, Lawrence A., to Eaton Corporation. Pressure operated pilot control shut-off valve. 4,174,824, Cl. 251-30.000.

Kominek, Leo A.: *See—*
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,175,006, Cl. 435-55.000.

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Kovalsky, Georgy A.; Maishev, Jury P.; Egorov, Boris A.; and Dmitriev, Jury A. Apparatus for ion plasma coating of articles. 4,175,029, Cl. 204-298.000.
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Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
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Ozawa, Kohe; Hosoya, Kazuhiro; Kurita, Jiro; and Honda, Makoto, 4,175,176, Cl. 526-309.000.
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Lalonde, A. Roger. Vehicle tray and mounting bracket assembly. 4,174,669, Cl. 108-44.000.
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Lee, Hop. Electric plug. 4,174,874, Cl. 339-14.00P.
Lee, John W.: *See*—
Schrougham, Benton; and Lee, John W., 4,174,553, Cl. 24-74.00R.
Lee, Thomas B. K.: *See*—
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,175,209, Cl. 562-473.000.
Leeds & Northrup Company: *See*—
Jenkins, Theron W., Jr.; and Barber, Justus C., 4,174,618, Cl. 60-664.000.
Legrand, Paul J.; and Naud, Henry, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Locking system for sliding cowlings of turbojet engine nacelles. 4,174,609, Cl. 60-262.000.
LeGrand, Pierre N.; and Van Dalen, Dirk J. Method and apparatus for reforming and straightening vehicles. 4,174,623, Cl. 72-34.000.
Les-Kare, Inc.: *See*—
Glass, Neel W., 4,174,754, Cl. 168-18.000.
Leuchtenberger, Wolfgang: *See*—
Klenk, Herbert; Schwarze, Werner; and Leuchtenberger, Wolfgang, 4,175,188, Cl. 544-182.000.
Levine, Fred. Brackets for mounting motors. 4,174,821, Cl. 248-661.000.
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., to Texas Gas Transmission Corporation. Radiolytic-chemical method for production of gases. 4,175,016, Cl. 204-157.10H.
Lewis, John R., to Harnessed Energies, Inc. Borehole drift-direction probe. 4,174,577, Cl. 33-302.000.
Lewis, Thomas H.: *See*—
Tatum, Joe F.; and Lewis, Thomas H., 4,175,021, Cl. 204-196.000.
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kuiikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P. Semiconductor

photovoltaic generator and method of fabricating thereof. 4,174,978, Cl. 136-89.0PC.

Liebert, Karl-Heinz, to Zahnradfabrik Friedrichshafen AG. Pressure agent control arrangements, especially for hydraulic steering arrangements for motor vehicles. 4,174,612, Cl. 60-384.000.

Liedke, Carl F., to O. F. Mossberg & Sons, Inc. Gas-sealing means for tubular magazine gas-operated firearm. 4,174,654, Cl. 89-191.00A.

Liepert, Rudolf: *See*—
Marass, Josef; and Liepert, Rudolf, 4,174,831, Cl. 271-159.000.

Liggett Group Inc.: *See*—
Hall, Floyd V., 4,174,720, Cl. 131-90.000.

Lilly Industries Limited: *See*—
Hendriksen, Barry A., 4,174,960, Cl. 71-121.000.
Ross, William J.; Todd, Alex; and Verge, John P., 4,175,131, Cl. 424-272.000.

Lindahl, Eugenie Z.: *See*—
Schreiber, Hinda S.; Lindahl, Eugenie Z.; and Smith, Polly P., 4,174,717, Cl. 128-494.000.

Lindgren, Goran E. S.: *See*—
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., 4,175,073, Cl. 260-112.00R.

Lindstrom, Ivan T., to Copeland Corporation. Refrigeration compressor lubrication. 4,174,927, Cl. 417-372.000.

Link, William T.; Haney, Jerry D.; and Jansen, William D., to American Optical Corporation. Apparatus and process for antifact rejection through cross correlation in sphygmometry. 4,174,707, Cl. 128-681.000.

Linnman, Sven N. J.; Isoz, Peter; Branderud, Nils P.; and Udden, Per E. C. Device to protect against flow of current. 4,175,255, Cl. 328-7.000.

Lipodat, Konstantin K.: *See*—
Skakunov, Mikhail G.; Lipodat, Konstantin K.; Karasev, Leonid V.; and Modzelevsky, Vilgelm V., 4,174,989, Cl. 156-156.000.

List, Hans: *See*—
Kirchweger, Karl; and Roschmann, Josef, 4,174,574, Cl. 33-126.70R.

Litton Industrial Products, Inc.: *See*—
Houseman, Kenneth R., 4,175,026, Cl. 204-272.000.

Lollar, Elizabeth D.: *See*—
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,175,086, Cl. 549-51.000.

Lombardi, Bernard; and Lunel, Jean, to Rhone-Poulenc Industries. Polyheterocyclic-antibiotic. 4,175,126, Cl. 424-263.000.

Long, Olan L., to White-Westinghouse Corporation. Dishwasher water distribution apparatus. 4,174,723, Cl. 134-144.000.

Lonseth, Wayne F., to Esquire, Inc. Ceiling mounted support structure. 4,175,281, Cl. 362-148.000.

Love, Robert B.; and Bowen, Alan W., to Battelle Development Corporation. Two-sided planar magnetron sputtering apparatus. 4,175,030, Cl. 204-298.000.

Lubashevsky, Alexei V.: *See*—
Kremlev, Vyacheslav Y.; Nazarian, Artashes R.; Lubashevsky, Alexei V.; and Kokin, Vilyam N., 4,175,240, Cl. 307-205.000.

Lucey, George K., Jr.; and Orrell, Michael G., to United States of America, Army. Springless impact switch. 4,174,666, Cl. 102-216.000.

Luchaco, David G., to Bendix Corporation, The. Two-group/simultaneous full injection conversion system for multiple cylinder engines. 4,174,681, Cl. 123-32.0EA.

Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., to Masonite Corporation. Post-press molding of man-made boards to produce contoured furniture parts. 4,175,105, Cl. 264-112.000.

Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., to Masonite Corporation. Product containing high density skins on a low density core and method of manufacturing same. 4,175,148, Cl. 428-171.000.

Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., to Masonite Corporation. Mineral wool product containing high density skins and method of manufacturing same. 4,175,149, Cl. 428-171.000.

Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., to Masonite Corporation. Urea containing high density skin fiberboard with a low density core. 4,175,150, Cl. 428-171.000.

Luck, Allan J.: *See*—
Clarke, John T.; Luck, Allan J.; and Sutton, Roger F., 4,175,106, Cl. 264-118.000.

Lunel, Jean: *See*—
Lombardi, Bernard; and Lunel, Jean, 4,175,126, Cl. 424-263.000.

Lusk, Edwin B.; Riley, Douglas C., Jr.; and Creadh, Joseph P., III, to Stauffer Chemical Company. Process for purification of gases containing elemental sulfur. 4,175,112, Cl. 423-242.000.

Lutsker, Vladimir L.: *See*—
Grakov, Anatoly N.; Grebennik, Oleg I.; Dudin, Jury A.; Lutsker, Vladimir L.; Makarov, Valery N.; Ogolikhin, Viktor M.; and Khrustaleva, Tatyana P., 4,174,929, Cl. 417-437.000.

Maahs, Gunther; and Rombusch, Konrad, to Chemische Werke Huls, A.G. Process for the manufacture of pentachlorovinylacetyl chloride. 4,175,095, Cl. 260-544.00Y.

Maccario, Floriano A.; and Affinita, Tommaso. Structural steel clamped joint. 4,174,911, Cl. 403-303.000.

MacKay, Kenneth D.; and Rogier, Edgar R., to Henkel Corporation. β-Diketones and the use thereof as metal extractants. 4,175,012, Cl. 204-108.000.

Maddux, Richard H. Extensible splint. 4,174,709, Cl. 128-85.000.

Madlener, Paul, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Land mine construction particularly an antipersonnel splinter mine. 4,174,665, Cl. 102-8.000.

Maeda, Riichi. Abrasive blasting machine. 4,174,593, Cl. 51-435.000.

Maestri, Bruno. Magazine device for continuously feeding nails into a nail driving machine. 4,174,802, Cl. 227-109.000.

Maishev, Jury P.: *See*—
Kovalsky, Georgy A.; Maishev, Jury P.; Egorov, Boris A.; and Dmitriev, Jury A., 4,175,029, Cl. 204-298.000.

Makarevich, Ivan F.; Khadzhai, Yaroslav I.; Pavlova, Valeria V.; and Nikolaeva, Anastasia V., to Kharkovsky Naucho-Issledovatelsky Khimfo-Farmatsevtiches-Ky Institut. Cardenolide and bufadienolide derivatives of ajmaline and process for producing same. 4,175,078, Cl. 260-239.570.

Makarov, Valery N.: *See*—
Grakov, Anatoly N.; Grebennik, Oleg I.; Dudin, Jury A.; Lutsker, Vladimir L.; Makarov, Valery N.; Ogolikhin, Viktor M.; and Khrustaleva, Tatyana P., 4,174,929, Cl. 417-437.000.

Mal, M. Kumar; and Tarkan, Stuart E., to Chromalloy American Corporation. Titanium carbide tool steel composition for hot-work application. 4,174,967, Cl. 75-237.000.

Manfreda, Alfred, to Siemens Aktiengesellschaft. Selectively tunable heterodyne receiver. 4,175,254, Cl. 325-433.000.

Manger, Werner: *See*—
Kispert, Klaus; Manger, Werner; and Weineck, Paul, 4,174,870, Cl. 308-217.000.

Mann, Don C., to Texas Instruments Incorporated. Recording system with flexible magnetic recording disc. 4,175,274, Cl. 360-99.000.

Manning Environmental Corp.: *See*—
Fleenor, Richard P.; and Cassady, Henry W., Jr., 4,174,722, Cl. 134-62.000.

Mansson, Martin: *See*—
Hunyadi, Laszlo; Andersson, Leif; and Mansson, Martin, 4,174,608, Cl. 60-39.650.

Mantha, Nagaraja S., to Agrimel Ltd. Methionine hydroxy analog-containing feed for lactating cows. 4,175,121, Cl. 424-94.000.

Marass, Josef; and Liepert, Rudolf, to Georg Spiess GmbH. Device for inscrting a new stack of sheets in feeding position without interruption of sheet-feeding mechanism operation. 4,174,831, Cl. 271-159.000.

Marrs, Duane K. Golf club including putting green slope correction aiming lines. 4,174,839, Cl. 273-183.00D.

Marsili, Leonardo: *See*—
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,175,077, Cl. 260-239.30P.

Martin, Alfred J.: *See*—
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., 4,175,016, Cl. 204-157.10H.

Martin, Richard H.; and Owens, William F., Jr., to Olin Corporation. Microperforated filter tip cigarette. 4,174,719, Cl. 131-10.00A.

Martin, Virgil B.; and Villers, Roger L., to Gehl Company. Chain drive including sprocket having alternate wide and narrow teeth. 4,174,642, Cl. 74-243.00R.

Marumoto, Katsuji: *See*—
Ohmae, Tsutomu; and Marumoto, Katsuji, 4,174,645, Cl. 74-866.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; Ferris, Michael J.; Arias, Henry; and Wozniak, Walter J., 4,174,835, Cl. 273-101.000.

Maryland Cup Corporation: *See*—
West, John B., 4,174,789, Cl. 222-240.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Fuhrmann, Wolfgang, 4,174,687, Cl. 123-90.130.

Masologites, George P.: *See*—
Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., 4,174,953, Cl. 44-1.00R.

Masonite Corporation: *See*—
Clarke, John T.; Luck, Allan J.; and Sutton, Roger F., 4,175,106, Cl. 264-118.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,105, Cl. 264-112.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,148, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,149, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,150, Cl. 428-171.000.

Massachusetts Institute of Technology: *See*—
Cannell, David S.; Giglio, Marzio; Benedek, George B.; von Schulthess, Gustav K.; and Cohen, Richard J., 4,174,952, Cl. 23-230.00B.
Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., 4,174,907, Cl. 366-279.000.

Mastrioanni, Rudolph G.: *See*—
Smith, Peter W.; and Mastrioanni, Rudolph G., 4,175,257, Cl. 330-287.000.

Masuda, Toshiyuki; and Sasaki, Takehiko, to Sharp Kabushiki Kaisha. Electronic watch having stopwatch function. 4,174,606, Cl. 58-39.500.

Mathbirk, Limited: *See*—
Birkhamshaw, Ronald G., 4,174,670, Cl. 112-25.000.

Mathes, Arnold; Person, Norman D.; and Vermeer, Stanley J., to Vermeer Manufacturing Company. Automatic round bale twine wrapping assembly. 4,174,661, Cl. 100-5.000.

Matsumoto, Kunio, to Copal Company Limited. X-Class synchronization contact means for electric shutters. 4,174,897, Cl. 354-133.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Iwaoka, Kazuo; Toh, Tagao; and Fukada, Minoru, 4,175,107, Cl. 422-114.000.

Matsuyoshi, Hideaki; Shimono, Yukio; Tsutsui, Yuji; Miyuki, Shigeru; Watanabe, Takao; and Mizota, Hideaki, to Kubota, Ltd. Running travel maneuvering apparatus for an engineering work vehicle. 4,174,761, Cl. 180-6.700.
Matsuzaka, Eiichi: *See*—
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, 4,175,278, Cl. 361-315.000.
Mattel, Inc.: *See*—
Morin, Marius J.; Gabler, Otto L.; and Kilroy, Eugene J., 4,174,587, Cl. 46-1.00K.
Maurhoff, Gerhard: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; and Bauder, Armin, 4,174,693, Cl. 123-139.0AW.
Mazzorana, Alfred B. Electric starter for an engine. 4,175,237, Cl. 290-38.00R.
McArthur, Donald A. Flue control assembly. 4,174,942, Cl. 431-20.000.
McBride, Paul T.: *See*—
Janata, Jiri; and McBride, Paul T., 4,175,020, Cl. 204-195.00B.
McCain Manufacturing Corporation: *See*—
McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer, 4,174,829, Cl. 270-55.000.
McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer, to McCain Manufacturing Corporation. Newspaper stuffers. 4,174,829, Cl. 270-55.000.
McCartney, Ronald L., to International Telephone and Telegraph Corporation. Single optical fiber connector. 4,174,882, Cl. 350-96.210.
McCracken, Oliver W.: *See*—
Roark, James T.; and McCracken, Oliver W., 4,174,729, Cl. 137-487.500.
McEntire, Edward E., to Texaco Development Corp. Bis(dimethylaminopropyl)-amine derivatives as polyurethane catalysts. 4,175,097, Cl. 260-570.50P.
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., to American Hoechst Corporation. Preparation of 6,11-dihydro-11-oxodibenz[b,e]-oxepin-2-acetic acid and precursors therefor. 4,175,209, Cl. 562-473.000.
McGuigan, Charles G.: *See*—
Arena, John P.; McGuigan, Charles G.; and Rossi, Gene A., 4,174,843, Cl. 277-3.000.
McKendree, Scott W. Feather plucking device. 4,174,551, Cl. 17-11.10R.
McKnight, Hugh P.; and Welty, Kenneth B., to Eli Lilly and Company. Apparatus for continuously orienting plastic and other types of bottles. 4,174,775, Cl. 198-397.000.
McKnight, John R. Commercial fishing net assembly with a porpoise escape zone. 4,174,582, Cl. 43-14.000.
McLaughlin, Donald W.; and Fetterer, Gerald F., to GTE Automatic Electric Laboratories Incorporated. Multiport conference circuit. 4,175,215, Cl. 179-18.0BC.
McNulty, John G.: *See*—
Selwitz, Charles M.; and McNulty, John G., 4,175,210, Cl. 568-689.000.
McSherry, Thomas W.; and Garfield, Nathaniel H., to Mechanical Plastics Corp. Paper clip and binder device. 4,174,910, Cl. 402-19.000.
Mead Corporation, The: *See*—
Sanders, Carlos L.; and Gebhardt, James L., 4,174,580, Cl. 40-518.000.
Meadows, Roger D., to Dayco Corporation. Machine for and method of making tubular conduit of indefinite length. 4,174,984, Cl. 156-143.000.
Mechanical Plastics Corp.: *See*—
McSherry, Thomas W.; and Garfield, Nathaniel H., 4,174,910, Cl. 402-19.000.
Mego Corp.: *See*—
Hennig, Michael; and Reiner, Lawrence, 4,174,833, Cl. 273-1.00E.
Meguro, Kanji: *See*—
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,175,079, Cl. 260-243.300.
Mehl, Thomas L. Device for permanent removal of hair. 4,174,713, Cl. 128-303.130.
Mehl, Thomas L. Method for permanent removal of hair. 4,174,714, Cl. 128-303.130.
Meier, Hermann R. E., to AB Volvo Penta. Two stroke cycle internal combustion engine. 4,174,685, Cl. 123-73.00A.
Meiji Seika Kaisha Ltd.: *See*—
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, 4,175,185, Cl. 544-28.000.
Meinke, William W.: *See*—
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., 4,175,016, Cl. 204-157.10H.
Meischen, Sandra J.: *See*—
Gale, Glen R.; and Meischen, Sandra J., 4,175,133, Cl. 424-287.000.
Meister, Herbert, to Herbert Meister and Co. Heat and solvent resistant flexible gasket means and process for production thereof. 4,174,990, Cl. 156-158.000.
Melcher, James R.: *See*—
Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., 4,174,907, Cl. 366-279.000.
Menard, Scott S.: *See*—
Kottke, Roger H.; and Menard, Scott S., 4,175,067, Cl. 260-30.40R.
Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr.; and Bicking, John B., 4,175,203, Cl. 560-55.000.
Zimmerman, Sheldon B.; and Chalmers, John H., Jr., 4,175,007, Cl. 435-105.000.
Merila, John B. Soda straw dispenser. 4,174,787, Cl. 221-254.000.
Merkle, Hans; Mueller, Albrecht; and Zoller, Karl, to BASF Aktiengesellschaft. Manufacture of 2,1,3-thiadiazin-4-one-2,2-dioxide derivatives. 4,175,184, Cl. 544-10.000.
Mesney, Douglas T. Rotatable stage for a camera. 4,174,887, Cl. 352-87.000.
Messer Griesheim GmbH: *See*—
Tocha, Klaus, 4,174,619, Cl. 62-52.000.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Bruderle, Ernst; Gottzein, Eveline; and Bittner, Helmut, 4,174,819, Cl. 244-169.000.
Meyer, Arnold: *See*—
Wassermann, Martin; Noweck, Klaus; and Meyer, Arnold, 4,175,118, Cl. 423-628.000.
Michelson, Herb. Soot blowing apparatus. 4,174,549, Cl. 15-318.000.
Mikulin, Tom T. Drafting instrument. 4,174,572, Cl. 33-31.000.
Milberger, Lionel J.; and Sasser, Byrd M., Jr. Transducer for determining strain data during piling. 4,174,625, Cl. 73-11.000.
Miller, Frank, to American Cyanamid Company. Process for the preparation of 1-chloro-2-hydroxy-3-naphthoic acid. 4,175,208, Cl. 562-467.000.
Miller, Ralph, to Ciba-Geigy Corporation. Non-electrolytic production of chlorine utilizing HCl derived from a cyanogen chloride process. 4,175,116, Cl. 423-500.000.
Miller, Roger D.: *See*—
Neuss, Norbert; and Miller, Roger D., 4,174,772, Cl. 435-32.000.
Milliken Research Corporation: *See*—
Arnott, Robert C.; and Willbanks, Charles E., 4,174,664, Cl. 101-127.000.
Willbanks, Charles E., 4,174,555, Cl. 26-16.000.
Minamitani, Eiji: *See*—
Ayano, Mitsutoshi; and Minamitani, Eiji, 4,175,218, Cl. 179-170.200.
Minolta Camera Kabushiki Kaisha: *See*—
Murasaki, Hiroshi; Enoguchi, Yuji; Wada, Kenichi; and Fujiwara, Takao, 4,174,904, Cl. 355-8.000.
Nakamura, Akiyoshi, 4,174,886, Cl. 350-215.000.
Tanaka, Harumi, 4,174,899, Cl. 354-213.000.
Mitchell, Robert D.; and Schulz, Albert C., to Combustion Engineering, Inc. Forming an extruded bar out of metal chips. 4,174,933, Cl. 425-79.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Oishi, Hideo, 4,174,749, Cl. 165-11.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, 4,175,171, Cl. 526-125.000.
Mitsuwa Shashin Kogyo Kabushiki Kaisha: *See*—
Ina, Tatsuo, 4,174,900, Cl. 354-293.000.
Mitumori, Yoshio: *See*—
Harakawa, Mototaka; and Mitumori, Yoshio, 4,175,262, Cl. 340-388.000.
Mixner, Ingomar, to U.S. Philips Corporation. Shaving head for dry-shaving apparatus. 4,174,568, Cl. 30-34.100.
Miyoshi, Yasuhiko: *See*—
Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, 4,175,163, Cl. 428-553.000.
Miyuki, Shigeru: *See*—
Matsuyoshi, Hideaki; Shimono, Yukio; Tsutsui, Yuji; Miyuki, Shigeru; Watanabe, Takao; and Mizota, Hideaki, 4,174,761, Cl. 180-6.700.
Mizokami, Kazunori; and Kawarada, Osamu, to Olympus Optical Co., Ltd. Adapter for electronic flash unit. 4,174,896, Cl. 354-132.000.
Mizota, Hideaki: *See*—
Matsuyoshi, Hideaki; Shimono, Yukio; Tsutsui, Yuji; Miyuki, Shigeru; Watanabe, Takao; and Mizota, Hideaki, 4,174,761, Cl. 180-6.700.
Mizukami, Fujio; and Imamura, Juichi, to Director-General of the Agency of Industrial Science and Technology. Method for the preparation of α-tetralone. 4,175,098, Cl. 260-590.0FA.
Mobil Oil Corporation: *See*—
Chen, Nai Y.; and Yan, Tsoung-Yuan, 4,175,211, Cl. 585-241.000.
Coant, Pierre M.; and Munns, George W., Jr., 4,175,046, Cl. 252-56.00S.
Driscoll, Patrick R., 4,175,081, Cl. 548-140.000.
Heiba, El Ahmadi I.; and Dessau, Ralph M., 4,175,089, Cl. 260-343.600.
Herrington, F. John, 4,174,932, Cl. 425-72.00R.
Horodysky, Andrew G., 4,175,043, Cl. 252-32.70E.
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,175,114, Cl. 423-329.000.
Schick, John W.; and Kaminski, Joan M., 4,175,047, Cl. 252-56.00S.
Modzelevsky, Vilgelm V.: *See*—
Skakunov, Mikhail G.; Lipodat, Konstantin K.; Karasev, Leonid V.; and Modzelevsky, Vilgelm V., 4,174,989, Cl. 156-156.000.
Moertel, George B., to Textron Inc. Molded element tape support for invisible slide fastener and method of manufacture. 4,175,104, Cl. 264-103.000.
Mohring, Edgar; and Muller, Hanns P., to Bayer Aktiengesellschaft. Process for the removal of lead ions from formose. 4,175,015, Cl. 204-131.000.
Moiseev, Viktor I.: *See*—
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery

N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

Mol, Hans C., to Pitney Bowes, Inc. Sheet feeder for a collator. 4,174,830, Cl. 270-58.000.

Molins Limited: *See—*
Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000.

Mondshine, Thomas C., to Texas Brine Corporation. Well completion and work over fluid and method of use. 4,175,042, Cl. 252-8.55R.

Monsanto Company: *See—*
Dobo, Emerick J.; and Graham, Tommy E., 4,175,153, Cl. 428-398.000.

Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., to Robertshaw Controls Company. Pneumatic indicator device and method of making the same. 4,174,564, Cl. 29-622.000.

Moore, Ronald D.; and Bethel, Everett L., to Chivas Products Ltd. Method and apparatus for making padded straps. 4,174,988, Cl. 156-213.000.

Morcom, William R.: *See—*
Sanders, Thomas J.; Morcom, William R.; and Davis, Jacob A., 4,174,562, Cl. 29-578.000.

Moren, Nils F. E.; and Wetterlin, Kjell I. L., to Aktiebolaget Draco. Device for use with medicinal inhalation devices. 4,174,712, Cl. 128-173.00R.

Morgan Construction Company: *See—*
Klusmier, Kenneth L., 4,174,662, Cl. 100-7.000.

Morgan, Denny E., to Bunker Ramo Corporation. Transistor bias circuit. 4,175,250, Cl. 323-22.00T.

Morin, Marius J.; Gabler, Otto L.; and Kilroy, Eugene J., to Mattel, Inc. Air turbine operated vehicle accelerator toy. 4,174,587, Cl. 46-1.00K.

Moriyama, Noboru: *See—*
Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; Takeuchi, Takashi; Moriyama, Noboru; and Fukuyama, Yukihiro, 4,175,066, Cl. 260-29.60M.

Morris, James C.: *See—*
Newell, P. Bruce; Morris, James C.; and Waymouth, John F., 4,174,944, Cl. 431-359.000.

Morrow, Richard B. A.: *See—*
Triplett, William C.; and Morrow, Richard B. A., 4,175,263, Cl. 340-573.000.

Moshal, John H.; and Murray, Alan B. Vehicle control speed sensing method. 4,174,765, Cl. 180-313.000.

Moss, Noel S.: *See—*
Bagga, Madan M.; and Moss, Noel S., 4,175,173, Cl. 528-97.000.

Motorola, Inc.: *See—*
Dolikian, Arman V., 4,175,256, Cl. 328-149.000.

Mowli, John C.; and Bala, Harry. Process for wrapping articles and providing reclosable container. 4,174,597, Cl. 53-410.000.

Moyer, William H., Jr., to Bethlehem Steel Corporation. Method for increasing fine coal filtration efficiency. 4,175,035, Cl. 209-5.000.

Mueller, Albrecht: *See—*
Merkle, Hans; Mueller, Albrecht; and Zoller, Karl, 4,175,184, Cl. 544-10.000.

Mueller-Tamm, Heinz: *See—*
Schweier, Guenther; Bachl, Robert; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gruber, Wolfgang; and Kolk, Erich, 4,175,170, Cl. 526-125.000.

Muller, Hanns P.: *See—*
Mohring, Edgar; and Muller, Hanns P., 4,175,015, Cl. 204-131.000.

Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. 6-Chloro-2,4-pyrimidine-dicarbamate-3-oxides. 4,175,189, Cl. 544-323.000.

Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. 6-Chloro-2,4-pyrimidine-dicarbamate-3-oxides. 4,175,190, Cl. 544-323.000.

Muller, Jurgen; Schmidt, Manfred; and Eickel, Rolf, to AGFA-Gevaert, A.G. Inography imaging method and chamber. 4,175,232, Cl. 250-315.200.

Muller, Lutz: *See—*
Junge, Bodo; Krause, Hans-Peter; Muller, Lutz; Puls, Walter; and Stoltefuss, Jurgen, 4,175,123, Cl. 424-180.000.

Muller, Walter: *See—*
Peetz, Wolfgang; Scheuch, Anton; and Muller, Walter, 4,174,915, Cl. 407-59.000.

Multi Restaurants Inc.: *See—*
Panzini, Michel A., 4,174,594, Cl. 52-65.000.

Mulzet, Alfred P.; and Trudgen, Gary A., to International Business Machines Corporation. Pressure monitoring system. 4,174,637, Cl. 73-730.000.

Munday, Theodore F.; and Walden, John, to FMC Corporation. Removal of phosphine from phosphine-contaminated carbon monoxide gas streams. 4,175,111, Cl. 423-210.000.

Munns, George W., Jr.: *See—*
Coant, Pierre M.; and Munns, George W., Jr., 4,175,046, Cl. 252-56.00S.

Murakami, Kyoichi: *See—*
Tsuchiya, Takao; Akazawa, Susumu; and Murakami, Kyoichi, 4,175,241, Cl. 307-262.000.

Murasaki, Hiroshi; Enoguchi, Yuji; Wada, Kenichi; and Fujiwara, Takao, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus for copying thick and thin originals. 4,174,904, Cl. 355-8.000.

Murata, Shinji; and Iwaya, Toshio, to Canon Kabushiki Kaisha. Device for detecting a moving body. 4,175,231, Cl. 250-227.000.

Murphey, James D. Method and apparatus for making and dispensing snow cones. 4,174,742, Cl. 141-11.000.

Murphy, Michael P., to General Motors Corporation. Heated solid electrolyte oxygen sensor. 4,175,019, Cl. 204-195.00S.

Murray, Alan B.: *See—*
Moshal, John H.; and Murray, Alan B., 4,174,765, Cl. 180-313.000.

Mutschler, Erich; and Weber, Adam, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Steering column switch mounting. 4,174,764, Cl. 180-78.000.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 4,175,191, Cl. 546-144.000.

Nagano, Hiroo; Ikeda, Chuki; Takahashi, Kenji; Kato, Naoyoshi; and Sato, Norio, to Hitachi Cable, Ltd. Device for cross-linking of coating material such as rubber or plastic, for electric wire. 4,174,677, Cl. 118-67.000.

Nagy, Laszlo; and Pulk, Donald J., to General Motors Corporation. Transmission and shift linkage. 4,174,644, Cl. 74-477.000.

Nakabayashi, Satoru: *See—*
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, 4,175,185, Cl. 544-28.000.

Nakada, Akira: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,174,650, Cl. 84-1.010.

Nakai, Osamu: *See—*
Goto, Yukio; Nakai, Osamu; and Yoshimori, Ikuo, 4,174,557, Cl. 29-157.10R.

Nakajima, Shokichi: *See—*
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, 4,175,185, Cl. 544-28.000.

Nakajima, Yoshikage: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Inai, Yuichi; Igarashi, Toshiji; Nakajima, Yoshikage; and Eisai Co., Ltd., 4,175,139, Cl. 424-343.000.

Nakamura, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Inverted telephoto lens system. 4,174,886, Cl. 350-215.000.

Nakamura, Nagatoshi, to Honda Giken Kogyo Kabushiki Kaisha. Rear carrier device on motorcycles and the like. 4,174,796, Cl. 224-39.000.

Nakamura, Toshiaki, to Olympus Optical Co., Ltd. Apparatus for automatically stopping a cassette tape recorder. 4,175,273, Cl. 360-74.300.

Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. Grooved deflection electrodes in an ink jet system printer. 4,175,266, Cl. 346-75.000.

Nakata, Kiyohiro, to Kabushiki Kaisha Mitutoyo Seisakusho. Measuring instrument. 4,174,575, Cl. 33-164.00R.

Narita, Noboru: *See—*
Imataki, Hiroyuki; Toma, Hitoshi; and Narita, Noboru, 4,174,883, Cl. 350-126.000.

Nash, Alfred C.: *See—*
Hargett, Jerry D.; and Nash, Alfred C., 4,174,873, Cl. 339-10.000.

Nash, Lawrence H. Piperidinyldithiocarbonic acid derivatives. 4,175,194, Cl. 546-189.000.

National Drying Machinery Corp. of America, The: *See—*
Parkes, Ralph C., 4,174,941, Cl. 431-3.000.

National Union Electric Corporation: *See—*
Brooks, Joseph F., 4,174,858, Cl. 285-7.000.

Natsugari, Hideaki: *See—*
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,175,079, Cl. 260-243.300.

Naud, Henry: *See—*
Legrand, Paul J.; and Naud, Henry, 4,174,609, Cl. 60-262.000.

Naveaux, Robert J.: *See—*
Bradley, Robert O.; Knighton, Heywood J.; and Naveaux, Robert J., 4,174,948, Cl. 432-54.000.

Nazarian, Artashes R.: *See—*
Kremlev, Vyacheslav Y.; Nazarian, Artashes R.; Lubashevsky, Alexei V.; and Kokin, Vilyam N., 4,175,240, Cl. 307-205.000.

NCR Corporation: *See—*
Fulks, Robert G.; Enfield, Robert E.; and Greenwood, Edward H., 4,174,805, Cl. 235-302.000.
Spence, Wendell, 4,175,291, Cl. 365-184.000.

Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, to Roussel UCLAF. N-Phenethyl-N-propyl-3,4-dihydroxyphenethylamines and salts thereof. 4,175,136, Cl. 424-330.000.

Nederlof, Anton M.; and Asselman, George A. A., to U.S. Philips Corporation. Insulated cylinder sleeve for a hot-gas engine. 4,174,616, Cl. 60-517.000.

Neff, Roger E.: *See—*
Schiller, Arthur M.; Goodman, Richard M.; and Neff, Roger E., 4,175,100, Cl. 525-327.000.

Nelimarkka, Juha A. E. Ball valve with reciprocal and rotatable spindle. 4,174,825, Cl. 251-86.000.

Nelson, Alfred M.; and Davis, David L., to AM International, Inc. Toner transfer system. 4,175,265, Cl. 346-74.100.

Nelson, Norman A., to Upjohn Company, The. 4,5,6-Trinor-3,7,-inter-m-phenylene prostaglandin A_1 analogs. 4,175,202, Cl. 560-53.000.

Nelson, Terry L. Support system. 4,174,704, Cl. 126-438.000.

Neuss, Norbert; and Miller, Roger D., to Eli Lilly and Company. Apparatus and method for coordinating chromatographic separation

(HPLC) with UV/VIS absorbency values and with bioautograph test results. 4,174,772, Cl. 435-32.000.

Newell, P. Bruce; Morris, James C.; and Waymouth, John F., to GTE Sylvania Incorporated. Single lead electrically-activated flashlamp. 4,174,944, Cl. 431-359.000.

NFE International Ltd.: *See*—
Dupre, George T.; and DeMarco, Thomas M., 4,174,591, Cl. 51-16.000.

Nichols, Billy M. Tube cleaner having anchored rotatable spiral member. 4,174,750, Cl. 165-94.000.

Nicoli, Jacques A. G., to Societe d'Exploitation de Produits et de Techniques pour l'Aeronautique et l'Automatique. Ultrasonic anemometer. 4,174,630, Cl. 73-194.00A.

Nihon Beru-Haueru Kabushiki Kaisha: *See*—
Osawa, Noriaki, 4,174,892, Cl. 354-25.000.

Nikolaeva, Anastasia V.: *See*—
Makarevich, Ivan F.; Khadzhai, Yaroslav I.; Pavlova, Valeria V.; and Nikolaeva, Anastasia V., 4,175,078, Cl. 260-239.570.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,174,650, Cl. 84-1.010.

Nippon Kogaku K.K.: *See*—
Fukuhara, Toru; and Shimomura, Jun, 4,174,894, Cl. 354-59.000.

Nippon Oil Co., Ltd.: *See*—
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,175,068, Cl. 260-31.2MR.

Nippon Petrochemicals Company, Limited: *See*—
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, 4,175,278, Cl. 361-315.000.

Nippon Steel Corporation: *See*—
Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, 4,175,163, Cl. 428-553.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.

Nishimoto, Shigeru: *See*—
Senuma, Masaru; Ishihara, Nobuhiko; Nishimoto, Shigeru; Yamato, Eisaku; and Shigematsu, Noboru, 4,175,206, Cl. 562-444.000.

Nissan Motor Company, Limited: *See*—
Anzai, Makoto, 4,174,680, Cl. 123-32.0EE.
Hosaka, Akio, 4,174,689, Cl. 123-119.0EC.

Niwa, Kazuo; Shibagaki, Masahiro; and Horiike, Yasuhiro, to Tokyo Shibaura Electric Co., Ltd. Apparatus for the plasma treatment of semiconductors. 4,175,235, Cl. 250-542.000.

Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with a subsidiary combustion chamber. 4,174,679, Cl. 123-30.00D.

Noji, Tasuku, to Alps Electric Co., Ltd. Construction of preset plate for VHF tuner. 4,175,259, Cl. 334-49.000.

Norman, Lloyd E.: *See*—
Hunter, Arthur C.; and Norman, Lloyd E., 4,175,286, Cl. 364-737.000.

Norris, David W.: *See*—
Buchwald, Warren G.; and Norris, David W., 4,175,283, Cl. 364-117.000.

Norteman, William E., Jr., to Union Carbide Corporation. Alkaline-MnO_2 cell having a zinc powder-gel anode containing P-N-V-P or PMA. 4,175,052, Cl. 252-182.100.

Northern Engraving Company: *See*—
Peters, Arnis E., 4,174,889, Cl. 353-12.000.

Nortron Corporation: *See*—
Curchod, Donald B., 4,174,760, Cl. 177-211.000.

Nowak, Manfred: *See*—
Viertel, Lothar; and Nowak, Manfred, 4,174,864, Cl. 296-97.00H.

Noweck, Klaus: *See*—
Wassermann, Martin; Noweck, Klaus; and Meyer, Arnold, 4,175,118, Cl. 423-628.000.

Nozawa, Takamitsu; Goto, Takayuki; Kishi, Takao; and Iizuka, Shigeo, to Yoshino Kogyosho Co., Ltd. Sprayer usable in both erect and inverted states. 4,174,790, Cl. 222-321.000.

Nubert, Ingomar: *See*—
Kleemann, Axel; Kiel, Reinhold; and Nubert, Ingomar, 4,175,088, Cl. 549-59.000.

Numakura, Toshihiko; and Hirai, Jun, to Sony Corporation. Video signal processing circuitry for compensating different average levels. 4,175,272, Cl. 360-34.000.

Nusser, Hermann: *See*—
Greiner, Max; Peters, Klaus J.; Schelhas, Peter; Stiefel, Peter; and Nusser, Hermann, 4,175,102, Cl. 261-50.00A.

O. F. Mossberg & Sons, Inc.: *See*—
Liedke, Carl F., 4,174,654, Cl. 89-191.00A.

Obata Industry & Commerce Co., Ltd.: *See*—
Ito, Tateo; and Kaneko, Tomijiro, 4,175,146, Cl. 427-304.000.

Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Watanabe, Hironori; Kondo, Tatsunori; Kugisawa, Toshio; and Washiyama, Yutaka, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,174,649, Cl. 84-1.010.

Oberthur, Heinrich, to ITT Industries, Inc. Brake force regulator for a motorcycle hydraulic brake system. 4,174,867, Cl. 303-6.00C.

O'Bryan, Henry M., Jr.: *See*—
Fleming, James W., Jr.; O'Bryan, Henry M., Jr.; and Thomson, John, Jr., 4,175,060, Cl. 252-518.000.

Obsomer, Marc, to Solvay & Cie. Hollow body made from a thermoplastic. 4,174,782, Cl. 215-1.00C.

Occidental Oil Shale, Inc.: *See*—
Compton, Leslie E., 4,174,751, Cl. 166-256.000.

Ochi, Shigeyuki; Yamazaki, Hiroshi; and Yamanaka, Seisuke, to Sony Corporation. Solid state color camera. 4,175,268, Cl. 358-44.000.

Odell, John R.: *See*—
Holko, Kenneth H.; and Odell, John R., 4,175,225, Cl. 219-121.00P.

Odenwalder, Heinrich; and Ranz, Erwin, to AGFA-Gevaert, A.G. Light sensitive photographic material. 4,174,969, Cl. 430-445.000.

Offermanns, Heribert: *See*—
Beschke, Helmut; Friedrich, Heinz; and Offermanns, Heribert, 4,175,195, Cl. 546-250.000.

Officine Savio S.p.A.: *See*—
d'Agnolo, Armando, 4,174,799, Cl. 226-7.000.

Ogolikhin, Viktor M.: *See*—
Grakov, Anatoly N.; Grebennik, Oleg I.; Dudin, Jury A.; Lutsker, Vladimir L.; Makarov, Valery N.; Ogolikhin, Viktor M.; and Khrustaleva, Tatyana P., 4,174,929, Cl. 417-437.000.

Oguro, Tomokatsu: *See*—
Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro; and Oguro, Tomokatsu, 4,175,245, Cl. 315-39.710.

O'Hara, Kim L.: *See*—
Beals, Charles D.; Fitzpatrick, George I.; and O'Hara, Kim L., 4,175,169, Cl. 526-64.000.

Ohmae, Tsutomu; and Marumoto, Katsuji, to Agency of Industrial Science and Technology, The. Automatic change-gear control device for use in electromobile. 4,174,645, Cl. 74-866.000.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Line guide assembly for fishing rods. 4,174,583, Cl. 43-24.000.

Ohta, Hirofumi; Futami, Toshio; and Umeyama, Kazuo, to Hitachi, Ltd. Magnetic bubble memory devices. 4,175,288, Cl. 365-2.000.

Ohtake, Toshiro. Construction for a water closet. 4,174,546, Cl. 4-420.000.

Oishi, Hideo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Air conditioning display system for vehicles. 4,174,749, Cl. 165-11.000.

Oldendorf, William H. Method and apparatus for ultra sound imaging utilizing Rayleigh backscatter. 4,174,635, Cl. 73-606.000.

Olin Corporation: *See*—
Knollmueller, Karl O., 4,175,049, Cl. 252-78.300.
Martin, Richard H.; and Owens, William F., Jr., 4,174,719, Cl. 131-10.00A.
Sakowski, Walter J., 4,175,038, Cl. 210-62.000.

Olson, Leslie C., to University of Minnesota, The Regents of the. Sterile surgical cord and tube retractor. 4,174,816, Cl. 242-47.500.

Olympus Optical Co., Ltd.: *See*—
Mizokami, Kazunori; and Kawarada, Osamu, 4,174,896, Cl. 354-132.000.
Nakamura, Toshiaki, 4,175,273, Cl. 360-74.300.
Tsuchihashi, Yasutaka; and Omoto, Tatsuhiko, 4,174,876, Cl. 339-96.000.

O'Mahony, John S.: *See*—
Hyldon, Roy G.; and O'Mahony, John S., 4,175,124, Cl. 424-180.000.

Omoto, Tatsuhiko: *See*—
Tsuchihashi, Yasutaka; and Omoto, Tatsuhiko, 4,174,876, Cl. 339-96.000.

Ondetti, Miguel A.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. Substituted acyl derivatives of amino acids. 4,175,199, Cl. 548-336.000.

Oogami, Eiryo, to Yoshida Kogyo K.K. Lower frame for pivoted window. 4,174,590, Cl. 49-504.000.

Orova, Josef: *See*—
Podrapsky, Jiri; and Orova, Josef, 4,174,697, Cl. 123-148.00E.

Orrell, Michael G.: *See*—
Lucey, George K., Jr.; and Orrell, Michael G., 4,174,666, Cl. 102-216.000.

Osawa, Masanori: *See*—
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, 4,175,171, Cl. 526-125.000.

Osawa, Noriaki, to Nihon Beru-Haueru Kabushiki Kaisha. Automatic focusing system. 4,174,892, Cl. 354-25.000.

Osuga, Kunio: *See*—
Yamanaka, Tsutomu; Yasuda, Hiroshi; and Osuga, Kunio, 4,175,130, Cl. 424-270.000.

Otis Engineering Corporation: *See*—
Roark, James T.; and McCracken, Oliver W., 4,174,729, Cl. 137-487.500.

Otoguro, Yasuo: *See*—
Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, 4,175,163, Cl. 428-553.000.

Otsuki, Yutaka: *See*—
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,175,068, Cl. 260-31.2MR.

Owens-Illinois, Inc.: *See*—
Juvinall, Jonn W., 4,175,236, Cl. 250-566.000.

Owens, William F., Jr.: *See*—
Martin, Richard H.; and Owens, William F., Jr., 4,174,719, Cl. 131-10.00A.

Oxy Metal Industries Corporation: *See*—
Howell, John K., Jr.; and Kulick, Leonard, 4,174,980, Cl. 148-6.14R.

Oxygen Enrichment Co., Ltd.: *See*—
Blackmer, Richard H.; and Hedman, Jonathan W., 4,174,955, Cl. 55-158.000.

Ozawa, Kohe; Hosoya, Kazuhiro; Kurita, Jiro; and Honda, Makoto, to Asahi Kasei Kogyo Kabusihiki Kaisha. Solvent resistant acrylic resin composition. 4,175,176, Cl. 526-309.000.

P. R. Mallory & Co. Inc.: *See—*
Sandler, Louis M., 4,175,239, Cl. 307-116.000.

Pace, Marshall O.: *See—*
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,175,048, Cl. 252-63.500.

Pacific Marine & Supply Co., Ltd.: *See—*
Seidl, Ludwig H., 4,174,671, Cl. 114-61.000.

Pagano, Dominick A. Two wheel ultrasonic rail testing system and method. 4,174,636, Cl. 73-636.000.

Pai, Robert Y.: *See—*
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,175,048, Cl. 252-63.500.

Pallay, Eduard, to Vyzkumny ustav bavlnarsky. Method of and apparatus for spinning yarn in an air vortex in a spinning tube. 4,174,605, Cl. 57-58.890.

Pampuch, Klaus, to Auergesellschaft GmbH. Connection between two different parts of a person's protective covering. 4,174,710, Cl. 128-142.700.

Panzica, Nace J.; and Cruze, Tyrone A. Foot rest assembly for motorcycle. 4,174,852, Cl. 280-291.000.

Panzini, Michel A., to Multi Restaurants Inc. Closable sales kiosk. 4,174,594, Cl. 52-65.000.

Papageorgion, Konstantin: *See—*
Berger, Johann; Berger, Josef; and Papageorgion, Konstantin, 4,174,738, Cl. 139-384.00R.

Parker-Hannifin Corporation: *See—*
Scott, Lynn S., 4,174,846, Cl. 277-205.000.

Parkes, Ralph C., to National Drying Machinery Corp. of America, The. Sleeve and damper for oil burner. 4,174,941, Cl. 431-3.000.

Parr, Alan J.; and Brown, Bryan O., to Freeman Chemical Corporation. Light-colored unsaturated polyester resins containing at least 2% bromine by weight. 4,175,072, Cl. 528-299.000.

Parrish, Charles A., to Sperry Rand Corporation. Telescoping lateral limit link. 4,174,603, Cl. 56-208.000.

Parrish, Charles A.: *See—*
Webb, Bryant F.; and Parrish, Charles A., 4,174,602, Cl. 56-208.000.

Parsons, James D.; and Sivak, Jerome A., to Union Tank Car Company. Methods for loading and unloading liquids from a railroad tank car. 4,174,741, Cl. 141-2.000.

Partus, Fred P., to Western Electric Company, Incorporated. Non-contacting seal for treating chamber through which elongated material is moved. 4,174,842, Cl. 277-3.000.

Paschal, Gloria C.: *See—*
Thompson, Gerald L.; Paschal, Gloria C.; and Conrad, Robert A., 4,175,080, Cl. 260-244.400.

Paschetto, Paul E. Golf putter aligning device. 4,174,838, Cl. 273-163.00A.

Pasqualucci, Carmine: *See—*
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,175,077, Cl. 260-239.30P.

Paulson, Danton L.; and Worthington, Robert B., to United States of America, Interior. Powder agglomerator and its method of use. 4,174,937, Cl. 425-222.000.

Pavlova, Valeria V.: *See—*
Makarevich, Ivan F.; Khadzhai, Yaroslav I.; Pavlova, Valeria V.; and Nikolaeva, Anastasia V., 4,175,078, Cl. 260-239.570.

Payton, Alan J., to Corning Glass Works. Electrode membrane. 4,175,028, Cl. 204-296.000.

Peetz, Wolfgang; Scheuch, Anton; and Muller, Walter, to Hawera Probst GmbH & Co. Milling cutter, especially contour milling cutter. 4,174,915, Cl. 407-59.000.

Pelchuck, John, Jr.: *See—*
Rasero, Lawrence J.; Pelchuck, John, Jr.; and Howard, Gordon H., 4,174,739, Cl. 139-388.000.

Perry, Clifford R.: *See—*
Belvin, David S.; Perry, Clifford R.; and Watkins, Dale F., 4,174,987, Cl. 156-197.000.

Persik, Gerald E.: *See—*
Persik, James E.; and Persik, Gerald E., 4,174,559, Cl. 29-509.000.

Persik, James E.; and Persik, Gerald E., to J.J. & M. Fastening method. 4,174,559, Cl. 29-509.000.

Person, Norman D.: *See—*
Mathes, Arnold; Person, Norman D.; and Vermeer, Stanley J., 4,174,661, Cl. 100-5.000.

Peters, Arnis E., to Northern Engraving Company. Travel monitor. 4,174,889, Cl. 353-12.000.

Peters, Klaus J.: *See—*
Greiner, Max; Peters, Klaus J.; Schelhas, Peter; Stiefel, Peter; and Nusser, Hermann, 4,175,102, Cl. 261-50.00A.

Peterson, Donald J., to Procter & Gamble Company, The. Base reactant. 4,175,053, Cl. 252-192.000.

Peterson, Earl C., to Electroosmosis Inc. System for heave reduction in highways due to frost or moisture in expansive clay or shale materials. 4,174,912, Cl. 404-27.000.

Petitpierre, Jean C.: *See—*
Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., 4,174,856, Cl. 282-27.500.

Petraglia, Vincent J.: *See—*
Goller, Glen J.; Petraglia, Vincent J.; and Salonia, Joseph R., 4,175,055, Cl. 252-425.300.

Petrolite Corporation: *See—*
Tait, William S.; and Greenlee, Roy W., 4,175,054, Cl. 252-331.000.

Pfenning, Dwight B.; Higginbottom, Lonnie C.; and Sliepcevich, Cedomir M., to Sliepcevich, Cedomir M. Apparatus for exchanging energy between high and low pressure systems. 4,174,925, Cl. 417-225.000.

Pfister, Rudolf: *See—*
Binder, Dieter; Hromatka, Otto; Pfister, Rudolf; and Zeller, Paul, 4,175,085, Cl. 549-65.000.

Pfizer Inc.: *See—*
Kadin, Saul B., 4,175,193, Cl. 546-153.000.
Taylor, Colin R., 4,175,128, Cl. 424-263.000.

Pharmacia Fine Chemicals AB: *See—*
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., 4,175,073, Cl. 260-112.00R.

Philbrick, Richard S.: *See—*
Lauritsen, Richard L.; and Philbrick, Richard S., 4,175,223, Cl. 200-159.00R.

Pilgram, Kurt H. G., to Shell Oil Company. Anilide derivative herbicides. 4,174,958, Cl. 71-88.000.

Pitegoff, Alexander D., to Teradyne, Inc. Analyzing electrical circuit boards. 4,175,253, Cl. 324-62.000.

Pitney Bowes, Inc.: *See—*
Mol, Hans C., 4,174,830, Cl. 270-58.000.

Pizzolato, Giacomo: *See—*
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,175,086, Cl. 549-51.000.

Pizzorno, Augusto, to Industrie Pirelli S.p.A. Apparatus for automatically handling a mold for tires with a rigid segmented core. 4,174,940, Cl. 425-577.000.

Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., to Mobil Oil Corporation. Method for producing zeolites. 4,175,114, Cl. 423-329.000.

Plavskikh, Vladimir D.: *See—*
Kostylev, Alexandr D.; Chepurnoi, Nikolai P.; Plavskikh, Vladimir D.; and Cherednikov, Evgeny N., 4,174,758, Cl. 175-19.000.

Plewes, John T.: *See—*
Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., 4,174,983, Cl. 148-102.000.

Plewka, Anna. Headlight glare reduction devices for vehicles. 4,175,280, Cl. 362-61.000.

Podrapsky, Jiri; and Orova, Josef, to Robert Bosch GmbH. System for advancing the ignition time in ignition systems having a magneto generator. 4,174,697, Cl. 123-148.00E.

Pohl, Douglas R.: *See—*
Blakey, Bruce H.; and Pohl, Douglas R., 4,174,703, Cl. 126-430.000.

Poitte, Jacques, to Societe Technique des Entreprises Chimiques. Process for extracting uranium from ores. 4,175,108, Cl. 423-20.000.

Polaroid Corporation: *See—*
Burgarella, John P.; and Carcia, Peter P., 4,174,893, Cl. 354-29.000.

Pollack, Warren J.: *See—*
Harris, Robert R.; and Pollack, Warren J., 4,175,063, Cl. 260-22.00R.

Pollard, Ray E. T. Portable pocket for pocket watches. 4,174,798, Cl. 224-253.000.

Porter, Garry L. Composition and method to prevent accidental and intentional overdosage with psychoactive drugs. 4,175,119, Cl. 424-10.000.

Possis Corporation: *See—*
Dammar, Raymon H., 4,174,815, Cl. 242-7.05B.

Posson, Chester A. Rotary engine. 4,174,930, Cl. 418-36.000.

Potapov, Valery N.: *See—*
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

Potts, James E., to Union Carbide Corporation. Crosslinkable copolymer of a lactone and a polyfunctional acrylate. 4,175,177, Cl. 528-354.000.

Powell, Peter J.: *See—*
Armstrong, William A.; and Powell, Peter J., 4,175,168, Cl. 429-229.000.

Power Conversion, Inc.: *See—*
Rosansky, Martin G., 4,175,166, Cl. 429-56.000.

PPG Industries, Inc.: *See—*
Darlington, William B., 4,175,024, Cl. 204-252.000.
Gacesa, Gerald R., 4,175,018, Cl. 204-181.00T.
Gagne, Robert, 4,174,956, Cl. 65-99.00A.

Precision Industries, Inc.: *See—*
Kezran, Mitchell, 4,174,916, Cl. 407-108.000.

Preiss, Manfred: *See—*
Auchter, Bruno; Wagner, Karl-Heinz; Glimm, Gunter; and Preiss, Manfred, 4,174,791, Cl. 222-333.000.

Procter & Gamble Company, The: *See—*
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,175,075, Cl. 260-123.500.
Peterson, Donald J., 4,175,053, Cl. 252-192.000.

Puff, Roger M.: *See—*
Delessard, Serge L.; and Puff, Roger M., 4,174,947, Cl. 432-15.000.

Pugliese, John P.; and Robbins, Thomas J., to Econo-Brew, Inc. Coffee brewer. 4,174,659, Cl. 99-306.000.

Pulk, Donald J.: *See—*
Nagy, Laszlo; and Pulk, Donald J., 4,174,644, Cl. 74-477.000.

Puls, Walter: *See—*
Junge, Bodo; Krause, Hans-Peter; Muller, Lutz; Puls, Walter; and Stoltefuss, Jurgen, 4,175,123, Cl. 424-180.000.

Purdue Research Foundation: *See—*
Tsao, George T.; Ladisch, Michael R.; and Bose, Arindam, 4,174,976, Cl. 127-37.000.

Quaker Oats Company, The: *See—*
Clanton, W. Porter, 4,174,588, Cl. 46-44.000.
Hyldon, Roy G.; and O'Mahony, John S., 4,175,124, Cl. 424-180.000.
Kottke, Roger H.; and Menard, Scott S., 4,175,067, Cl. 260-30.40R.

Quinn, Thomas M.: *See—*
Chen, Stephen Y.; and Quinn, Thomas M., 4,175,071, Cl. 260-42.440.

R. A. Pearson Company: *See—*
Graham, Robert H., 4,174,658, Cl. 93-51.0HW.

Radke, John C.: *See—*
Jankelson, Bernard; and Radke, John C., 4,174,706, Cl. 128-741.000.

Rady, Bruce A.: *See—*
Flint, John R.; and Rady, Bruce A., 4,174,891, Cl. 353-26.00A.
Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,174,890, Cl. 353-26.00A.

Raleigh, William J., to General Electric Company. Silicone emulsions for treating silicate particulate matter. 4,175,159, Cl. 428-405.000.

Ralston Purina Company: *See—*
Daly, Thomas W.; Hoer, Ralph A.; Walsh, James E.; and James, Henry T., 4,174,975, Cl. 106-161.000.

Ramuz, Henri: *See—*
Muller, Jean-Claude; and Ramuz, Henri, 4,175,189, Cl. 544-323.000.
Muller, Jean-Claude; and Ramuz, Henri, 4,175,190, Cl. 544-323.000.

Ranz, Erwin: *See—*
Odenwalder, Heinrich; and Ranz, Erwin, 4,174,969, Cl. 430-445.000.

Rappaport, Alfred A. Disposable catalytic heater. 4,174,702, Cl. 126-208.000.

Rasero, Lawrence J.; Pelchuck, John, Jr.; and Howard, Gordon H., to Fenner America Ltd. Tubular fabric. 4,174,739, Cl. 139-388.000.

Rasheed, Khalid; and Warkentin, James D., to Ansul Company, The. Biocidally-active, 1,3-benzodithiole-2-one and 1,3-benzodithiole-2-thione compounds. 4,175,186, Cl. 544-145.000.

Raven, John, to American Chain & Cable Company, Inc. Bridge circuits. 4,174,639, Cl. 73-766.000.

Raychem Corporation: *See—*
Simpson, Damon G., 4,174,563, Cl. 29-628.000.

RCA Corporation: *See—*
Credelle, Thomas L.; and Spong, Fred W., 4,174,881, Cl. 350-3.630.

Rebikoff, Dimetri. Underwater TV surveillance of pipelines. 4,175,269, Cl. 358-99.000.

Recognition Equipment Incorporated: *See—*
Ferguson, Sammy J.; and Yohe, William R., 4,174,995, Cl. 156-494.000.

Reed, Robert D., to John Zink Company. Fuel gas preheat for excess oxygen maintenance. 4,174,943, Cl. 431-41.000.

Reichelt, Karl-Ludvig: *See—*
Boler, Jan B.; and Reichelt, Karl-Ludvig, 4,175,084, Cl. 260-326.440.

Reid, F. Joseph: *See—*
Rhodes, William H.; and Reid, F. Joseph, 4,174,973, Cl. 106-73.200.

Reid, Richard K. Device for citizens band radio users to determine highway location. 4,174,674, Cl. 116-307.000.

Reiner, Lawrence: *See—*
Hennig, Michael; and Reiner, Lawrence, 4,174,833, Cl. 273-1.00E.

Reinink, Arend; and Sheldon, Roger A., to Shell Oil Company. Preparation of α-cyano esters. 4,175,093, Cl. 260-465.00D.

Reinink, Arend; and Sheldon, Roger A., to Shell Oil Company. Preparation of esters. 4,175,094, Cl. 260-465.00D.

Reitz, Gunther; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Alkoxylated perfluoroalkanesulphonamides. 4,175,096, Cl. 260-556.00F.

Repco Research Proprietary Limited: *See—*
Hadaway, Bernard M., 4,174,845, Cl. 277-134.000.

Research Corporation: *See—*
Schmer, Gottfried, 4,175,182, Cl. 536-21.000.

Research Triangle Institute: *See—*
Adams, Daniel M., Jr.; Barach, Jeff T.; and Speck, Marvin L., 4,175,141, Cl. 426-522.000.

Reuben, Harold, to Akro Corporation, The. Process of laminating carpet to elastomeric backing. 4,174,991, Cl. 156-242.000.

Rheinhutte vorm. Ludwig Beck & Co.: *See—*
Auchter, Bruno; Wagner, Karl-Heinz; Glimm, Gunter; and Preiss, Manfred, 4,174,791, Cl. 222-333.000.

Rhodes, William H.; and Reid, F. Joseph, to GTE Laboratories Incorporated. Transparent yttria ceramics containing magnesia or magnesium aluminate. 4,174,973, Cl. 106-73.200.

Rhone-Poulenc Industries: *See—*
Decor, Jean-Pierre, 4,175,205, Cl. 560-260.000.
Lombardi, Bernard; and Lunel, Jean, 4,175,126, Cl. 424-263.000.

Rhone-Poulenc Textile: *See—*
Guillermin, Rene; Joly, Jean; and Sangalli, Silvio, 4,175,157, Cl. 428-369.000.

Rhyan, William C., to Clarke Carrier Corporation. Carrier readily attachable to a support. 4,174,866, Cl. 297-194.000.

Richard, Gerard Y., to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C. Process and apparatus for the continuous preparation of a mixture for foundry molds or the like, with formation of a premix. 4,174,906, Cl. 366-6.000.

Richard, Michel M.: *See—*
Drouzy, Michel L.; Richard, Michel M.; Huet, Francois P.; and Lacau, Henri M., 4,174,972, Cl. 106-64.000.

Richards, Gordon S.; Douglas, Peter E.; and Abraham, Alan G., to International Standard Electric Corporation. Method and apparatus for transferring control information between two members. 4,175,230, Cl. 250-199.000.

Richards Manufacturing Co., Inc.: *See—*
Treace, Harry T., 4,174,716, Cl. 128-350.00R.

Richardson, Victor E., to Dresser Industries, Inc. Latching mechanism for reciprocating impact tools. 4,174,848, Cl. 279-19.500.

Richings, Richard R. Casket. 4,174,556, Cl. 27-7.000.

Richter, Johan C. F. C., to Kamyr Aktiebolag. Method and apparatus for continuous hydrolysis of cellulosic fiber material. 4,174,997, Cl. 162-19.000.

Ricker, Charles W.: *See—*
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., 4,175,016, Cl. 204-157.10H.

Riddel, John W., to General Motors Corporation. Vacuum latching dump valve. 4,174,727, Cl. 137-111.000.

Riedel, Tilo, to S.A. Etablissements Francois Salomon & Fils. Ski brake with brake elements adapted to form a tread body engageable by a ski boot and with inwardly bent spring wire. 4,174,853, Cl. 280-605.000.

Riehle, Frederick W., to A-T-O Inc. Zero pressure accumulating conveyor and method. 4,174,777, Cl. 198-781.000.

Riley, Douglas C., Jr.: *See—*
Lusk, Edwin B.; Riley, Douglas C., Jr.; and Creadh, Joseph P., III, 4,175,112, Cl. 423-242.000.

Rippel, Kurt: *See—*
Hahn, Carl-Georg; and Rippel, Kurt, 4,175,142, Cl. 426-605.000.

Ritzenthaler, Richard L.: *See—*
Arnold, Don C.; Silletti, Julio D.; Ritzenthaler, Richard L.; and Wilcox, Thomas J., 4,174,726, Cl. 137-100.000.

Roark, James T.; and McCracken, Oliver W., to Otis Engineering Corporation. Pressure sensing safety device. 4,174,729, Cl. 137-487.500.

Robbins, Daniel H., to Itek Corporation. End of roll detector. 4,174,817, Cl. 242-57.000.

Robbins, Thomas J.: *See—*
Pugliese, John P.; and Robbins, Thomas J., 4,174,659, Cl. 99-306.000.

Robert Bosch GmbH: *See—*
Drews, Ulrich; and Singer, Erich, 4,174,682, Cl. 123-32.0EE.
Greiner, Max; Peters, Klaus J.; Schelhas, Peter; Stiefel, Peter; and Nusser, Hermann, 4,175,102, Cl. 261-50.00A.
Honig, Guenther; Kiencke, Uwe; and Zechnall, Martin, 4,174,688, Cl. 123-117.00D.
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.
Podrapsky, Jiri; and Orova, Josef, 4,174,697, Cl. 123-148.00E.
Wessel, Wolf; Stumpp, Gerhard; and Knapp, Heinrich, 4,174,692, Cl. 123-139.0AW.
Wessel, Wolf; and Sautter, Wilfried, 4,174,694, Cl. 123-140.0MC.
Zabler, Erich; Jansche, Walter; and Heintz, Frieder, 4,174,638, Cl. 73-728.000.

Roberts, James W.: *See—*
Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., 4,174,728, Cl. 137-240.000.

Robertshaw Controls Company: *See—*
Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,174,564, Cl. 29-622.000.

Rockwell International Corporation: *See—*
Duffey, Donn W., 4,174,656, Cl. 92-134.000.
Fuhrman, James L., 4,175,287, Cl. 364-900.000.
Immorlica, Anthony A., Jr., 4,174,982, Cl. 148-13.100.

Rodondi, Andrew F.: *See—*
Hawkins, Harold G.; and Rodondi, Andrew F., 4,174,880, Cl. 339-217.00S.

Rogers, Arden D.: *See—*
Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,174,564, Cl. 29-622.000.

Rogier, Edgar R.: *See—*
MacKay, Kenneth D.; and Rogier, Edgar R., 4,175,012, Cl. 204-108.000.

Rohde, Wolfgang, to Bergwerksverband GmbH. Process for drying coal in two-stage flow-through circulation heaters. 4,174,946, Cl. 432-14.000.

Roland Corporation: *See—*
Kakehashi, Ikutaro, 4,174,651, Cl. 84-1.110.

Rombusch, Konrad: *See—*
Maahs, Gunther; and Rombusch, Konrad, 4,175,095, Cl. 260-544.00Y.

Roozenbeek, Herman: *See—*
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.

Rosansky, Martin G., to Power Conversion, Inc. Sealed container construction capable of safely venting internal pressure. 4,175,166, Cl. 429-56.000.

Roschmann, Josef: *See—*
Kirchweger, Karl; and Roschmann, Josef, 4,174,574, Cl. 33-126.70R.

Rose, Leslie C.: *See—*
Hamrick, Joseph T.; and Rose, Leslie C., 4,174,926, Cl. 417-334.000.

Roseby, Bernard; and Hallmann, Eckhard P. Variable stroke internal combustion engine. 4,174,684, Cl. 123-48.00B.

Rosinski, Edward J.: *See*—
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,175,114, Cl. 423-329.000.
Ross, William J.; Todd, Alex; and Verge, John P., to Lilly Industries Limited. Oxazole ureas formulations and asthma treatment. 4,175,131, Cl. 424-272.000.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, to ARCHIFAR Industrie Chimiche del Trentino S.p.A. Rifamycin compounds. 4,175,077, Cl. 260-239.30P.
Rossi, Gene A.: *See*—
Arena, John P.; McGuigan, Charles G.; and Rossi, Gene A., 4,174,843, Cl. 277-3.000.
Rotz, Christopher A.: *See*—
Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., 4,174,907, Cl. 366-279.000.
Roussel UCLAF: *See*—
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,175,136, Cl. 424-330.000.
Royon, Jean: *See*—
Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000.
Rubin, Mae K.: *See*—
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,175,114, Cl. 423-329.000.
Russell, David E. Jewelry with adhesive insert for lifting objects. 4,174,620, Cl. 63-1.00R.
Ryabikov, Stanislav V.: *See*—
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
Saito, Tamaki: *See*—
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.
Saito, Toshinori: *See*—
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, 4,175,185, Cl. 544-28.000.
Sakai, Masao: *See*—
Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro; and Oguro, Tomokatsu, 4,175,245, Cl. 315-39.710.
Sakashita, Noriji: *See*—
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Watanabe, Hironori; Kondo, Tatsunori; Kugisawa, Toshio; and Washiyama, Yutaka, 4,174,649, Cl. 84-1.010.
Sakowski, Walter J., to Olin Corporation. Purification of waste streams containing available chlorine. 4,175,038, Cl. 210-62.000.
Salonia, Joseph R.: *See*—
Goller, Glen J.; Petraglia, Vincent J.; and Salonia, Joseph R., 4,175,055, Cl. 252-425.300.
Sammons, John K.; and Fox, Charles H., Jr., to Continental Oil Company. Centrifugal water oil separator. 4,175,040, Cl. 210-78.000.
Sanda, Shougo: *See*—
Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, 4,174,679, Cl. 123-30.00D.
Sanders, Carlos L.; and Gebhardt, James L., to Mead Corporation, The. Adjustable indicating device. 4,174,580, Cl. 40-518.000.
Sanders, Thomas J.; Morcom, William R.; and Davis, Jacob A., to Harris Corporation. Process for forming metallic ground grid for integrated circuits. 4,174,562, Cl. 29-578.000.
Sandler, Louis M., to P. R. Mallory & Co. Inc. Detection means for touch control switches. 4,175,239, Cl. 307-116.000.
Sandoz, Inc.: *See*—
Barcza, Sandor, 4,175,091, Cl. 260-448.20N.
Houlihan, William J.; and Nadelson, Jeffrey, 4,175,191, Cl. 546-144.000.
Kathawala, Faizulla G., 4,175,138, Cl. 424-341.000.
Sangalli, Silvio: *See*—
Guillermin, Rene; Joly, Jean; and Sangalli, Silvio, 4,175,157, Cl. 428-369.000.
Sankokiki Kabushiki Kaisha: *See*—
Yasue, Setsuo; and Yamamoto, Tomio, 4,174,797, Cl. 224-42.210.
Sasaki, Heizo: *See*—
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, 4,175,171, Cl. 526-125.000.
Sasaki, Takehiko: *See*—
Masuda, Toshiyuki; and Sasaki, Takehiko, 4,174,606, Cl. 58-39.500.
Sasser, Byrd M., Jr.: *See*—
Milberger, Lionel J.; and Sasser, Byrd M., Jr., 4,174,625, Cl. 73-11.000.
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, to Nippon Petrochemicals Company, Limited. Electric insulating oil compositions. 4,175,278, Cl. 361-315.000.
Sato, Norio: *See*—
Nagano, Hiroo; Ikeda, Chuki; Takahashi, Kenji; Kato, Naoyoshi; and Sato, Norio, 4,174,677, Cl. 118-67.000.
Saunders, Elerington. Agglomerating particulate perlite. 4,175,158, Cl. 428-402.000.
Sautter, Wilfried: *See*—
Wessel, Wolf; and Sautter, Wilfried, 4,174,694, Cl. 123-140.0MC.
Savelkouls, Leonardus J. Apparatus for metal coatings. 4,174,994, Cl. 156-380.000.
Sawada, Eiji, to Denki Onkyo Co., Ltd. Deflection yoke. 4,175,261, Cl. 335-210.000.
Schaefer, Donald W., to International Business Machines Corporation. R/W Arm that prevents catastrophic failure. 4,175,275, Cl. 360-104.000.
Schaefer, James H.: *See*—
Wilson, Jeffrey V.; Schaefer, James H.; Glowacz, Anthony A.; and Bayha, Jack, 4,174,875, Cl. 339-91.00P.
Schelhas, Peter: *See*—
Greiner, Max; Peters, Klaus J.; Schelhas, Peter; Stiefel, Peter; and Nusser, Hermann, 4,175,102, Cl. 261-50.00A.
Schenk, Hans; Sprung, Maria; and Sprung, Walter. Electric razor. 4,174,569, Cl. 30-43.300.
Schenley Industries, Inc.: *See*—
Slone, Adolph, 4,174,779, Cl. 206-427.000.
Scheuch, Anton: *See*—
Peetz, Wolfgang; Scheuch, Anton; and Muller, Walter, 4,174,915, Cl. 407-59.000.
Schick, John W.; and Kaminski, Joan M., to Mobil Oil Corporation. Synthetic ester and hydrogenated olefin oligomer lubricant and method of reducing fuel consumption therewith. 4,175,047, Cl. 252-56.00S.
Schiff, Peter. Electronic synchronizer-monitor system for controlling the timing of mechanical assistance and pacing of the heart. 4,175,264, Cl. 340-747.000.
Schiller, Arthur M.; Goodman, Richard M.; and Neff, Roger E., to American Cyanamid Company. Preparation of anionic polymers for use as scale inhibitors and anti-precipitants. 4,175,100, Cl. 525-327.000.
Schliesser, Carroll G., to Schliesser, Myrtle M. Animal guard for field pipe. 4,174,913, Cl. 405-94.000.
Schliesser, Myrtle M.: *See*—
Schliesser, Carroll G., 4,174,913, Cl. 405-94.000.
Schlumberger Technology Corporation: *See*—
Chandler, Richard N., 4,175,251, Cl. 324-303.000.
Schmer, Gottfried, to Research Corporation. Separation of high-activity heparin by affinity chromatography on supported protamine. 4,175,182, Cl. 536-21.000.
Schmidt, Gunther: *See*—
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.
Schmidt, Manfred: *See*—
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Schrewelius, Nils G., to Bulten-Kanthal Aktiebolag. Silicon carbide body containing a molybdenum disilicide alloy. 4,174,971, Cl. 106-44.000.
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Hahn, Carl-Georg; and Rippel, Kurt, 4,175,142, Cl. 426-605.000.
Schrougham, Benton; and Lee, John W. Coupling device for animal collars. 4,174,553, Cl. 24-74.00R.
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Schwartz, Donald E. Magnetic pin setter useful in dentistry. 4,174,570, Cl. 433-53.000.
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Scott, Lynn S., to Parker-Hannifin Corporation. Sealing ring. 4,174,846, Cl. 277-205.000.
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Seidl, Ludwig H., to Pacific Marine & Supply Co., Ltd. Semisubmerged ship. 4,174,671, Cl. 114-61.000.
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Selwitz, Charles M.; and McNulty, John G., to Gulf Research and Development Company. Etherification process. 4,175,210, Cl. 568-689.000.
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House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., 4,174,561, Cl. 29-572.000.
Senior, Robert B.; and Yarbrough, Paul A., to Cooper Industries, Inc. Tool for applying connectors to flexible cable. 4,174,560, Cl. 29-566.100.
Sentralinstitutt for Industriell Forskning: *See*—
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Shane, Charles F. Door frame protector. 4,174,862, Cl. 292-346.000.
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Shea, Christopher J., to Stanley Works, The. Oven latch assembly with adjustable unlocking temperature sub-assembly. 4,174,860, Cl. 292-113.000.
Sheldon, Roger A.: *See*—
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Reinink, Arend; and Sheldon, Roger A., 4,175,094, Cl. 260-465.00D.
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Reinink, Arend; and Sheldon, Roger A., 4,175,094, Cl. 260-465.00D.
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased, 4,174,628, Cl. 73-151.000.
Shepard, Michael L., to Westvaco Corporation. Adjustable profile finger setting jig. 4,174,576, Cl. 33-181.00R.
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Shepherd, Patrick J.; and Hubble, David L., Sr., 4,174,598, Cl. 53-431.000.
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Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; Takeuchi, Takashi; Moriyama, Noboru; and Fukuyama, Yukihiro, to Kao Soap Co., Ltd. Dispersant for calcium carbonate. 4,175,066, Cl. 260-29.60M.
Shiel, Leslie E., to Associated Portland Cement Manufacturers Limited, The. Preflocculated filler compositions for use in the manufacture of paper. 4,174,998, Cl. 162-168.00N.
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Shimizu, Hiroshi; and Shinohara, Masamichi, to Toyo Kogyo Co., Ltd. Intake system for internal combustion engines. 4,174,686, Cl. 123-75.00B.
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Shrontz, Michael J.; and Harvey, Robert M., to Inland Container Corporation. Multicell corrugated bulk container. 4,174,803, Cl. 229-15.000.
Shrum, Lorne R. Tank for explosive forming. 4,174,624, Cl. 72-56.000.
Shuraym, George P., to Texas Instruments Incorporated. Multi-mode process control computer with bit processing. 4,175,284, Cl. 364-200.000.
Siemens Aktiengesellschaft: *See*—
Auchter, Bruno; Wagner, Karl-Heinz; Glimm, Gunter; and Preiss, Manfred, 4,174,791, Cl. 222-333.000.
Breimesser, Fritz; Kuznia, Christian; and Stein, Karl-Ulrich, 4,175,238, Cl. 307-40.000.
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Kleinschmidt, Peter, 4,175,242, Cl. 310-316.000.
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Simpson, Damon G., to Raychem Corporation. Wire wrap post terminator for stranded wire. 4,174,563, Cl. 29-628.000.
Sims, Eugene F.; and Dierlam, Trueman, to CRC-Crose International, Inc. Apparatus for transporting heavy equipment on a pipeline. 4,175,224, Cl. 219-60.00R.
Singer Company, The: *See*—
Lauritsen, Richard L.; and Philbrick, Richard S., 4,175,223, Cl. 200-159.00R.
Singer, Erich: *See*—
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Siri, Michael P., to FMC Corporation. Agitator assembly for a fruit-vine separator. 4,174,755, Cl. 171-27.000.
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Skakunov, Mikhail G.; Lipodat, Konstantin K.; Karasev, Leonid V.; and Modzelevsky, Vilgelm V. Method of fabricating double-curvature shells. 4,174,989, Cl. 156-156.000.
SKF Industrial Trading & Development Company B.V.: *See*—
Kispert, Klaus; Manger, Werner; and Weineck, Paul, 4,174,870, Cl. 308-217.000.
Slater, Frank W.; and Fuqua, Dale. Secondary recovery method and system for oil wells using solar energy. 4,174,752, Cl. 166-303.000.
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Pfenning, Dwight B.; Higginbottom, Lonnie C.; and Sliepcevich, Cedomir M., 4,174,925, Cl. 417-225.000.
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SLS, Inc.: *See*—
Schreiber, Hinda S.; Lindahl, Eugenie Z.; and Smith, Polly P., 4,174,717, Cl. 128-494.000.
Smith, Arthur W.; and Kimble, George D. Autocycling control circuit for heating and/or air conditioning systems. 4,174,807, Cl. 236-47.000.
Smith, Clarence E., Jr. Toilet stool ventilating device. 4,174,545, Cl. 4-217.000.
Smith, John G., to Burroughs Corporation. Insertion tool for integrated circuit packages. 4,174,566, Cl. 29-758.000.
Smith, Peter W.; and Mastrioanni, Rudolph G., to United Technologies Corporation. Modular microwave power combiner. 4,175,257, Cl. 330-287.000.
Smith, Polly P.: *See*—
Schreiber, Hinda S.; Lindahl, Eugenie Z.; and Smith, Polly P., 4,174,717, Cl. 128-494.000.
Smith, Russell M., to General Electric Company. Transformer inrush current detector. 4,175,276, Cl. 361-36.000.
SmithKline Corporation: *See*—
Bender, Paul E.; and Lantos, Ivan, 4,175,127, Cl. 424-263.000.
Smithson, Charles L., Jr., to Wallace Murray Corporation. Sheet metal fan assembly. 4,174,924, Cl. 416-132.00A.
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Freese, Lennart W., 4,174,732, Cl. 137-498.000.
Snelling, Christopher, to Xerox Corporation. Combined processing station for use in an electrophotographic printing machine. 4,174,903, Cl. 355-3.0CH.
Societe Anonyme Automobiles Citroen: *See*—
Dupin, Jean G. A., 4,174,698, Cl. 123-192.00B.
Societe Anonyme D.B.A.: *See*—
Courbot, Pierre, 4,174,770, Cl. 188-79.50P.
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Societe Anonyme des Imprimerie et Papeterie de l'Est: *See*—
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Societe Anonyme dite: Nodet-Gougis: *See*—
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s.a. Texaco Belgium n.v.: *See*—
Hermans, Johny C., 4,175,172, Cl. 528-27.000.
Hermans, Johny C., 4,175,174, Cl. 528-168.000.
Hermans, Johny C., 4,175,178, Cl. 528-373.000.
Hermans, Johny C., 4,175,179, Cl. 528-381.000.
Hermans, Johny C., 4,175,180, Cl. 528-399.000.
Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C.: *See*—
Richard, Gerard Y., 4,174,906, Cl. 366-6.000.
Societe d'Etudes pour la Recuperation Electrolytique du Zinc: *See*—
Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000.
Societe d'Exploitation de Produits et de Techniques pour l'Aeronautique et l'Automatique: *See*—
Nicoli, Jacques A. G., 4,174,630, Cl. 73-194.00A.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
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Societe Technique des Entreprises Chimiques: *See*—
Poitte, Jacques, 4,175,108, Cl. 423-20.000.
Solvay & Cie: *See*—
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Sony Corporation: *See*—
Numakura, Toshihiko; and Hirai, Jun, 4,175,272, Cl. 360-34.000.
Ochi, Shigeyuki; Yamazaki, Hiroshi; and Yamanaka, Seisuke, 4,175,268, Cl. 358-44.000.
Shinoda, Hatsuhiko, 4,175,252, Cl. 324-103.00P.
Tachi, Katsuichi, 4,175,267, Cl. 358-4.000.
Tsuchiya, Takao; Akazawa, Susumu; and Murakami, Kyoichi, 4,175,241, Cl. 307-262.000.
Speck, Marvin L.: *See*—
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Speigel, Kenneth, to GTE Sylvania Incorporated. Color cathode ray tube phosphors coated by a wetting agent. 4,175,143, Cl. 427-71.000.
Spence, Wendell, to NCR Corporation. Non-volatile random access memory cell. 4,175,291, Cl. 365-184.000.
Sperry Rand Corporation: *See*—
Parrish, Charles A., 4,174,603, Cl. 56-208.000.
Webb, Bryant F.; and Parrish, Charles A., 4,174,602, Cl. 56-208.000.
Spicka, Roland; Krob, Adolf; Seidel, Detlev; and Viefhaus, Paul, to Zettelmeyer Maschinenfabrick GmbH & Co. KG Konz. Building and constructional machines or vehicles. 4,174,854, Cl. 280-702.000.
Spiliotis, Nicholas J., to Allied Chemical Corporation. Sulfate-free method of etching copper pattern on printed circuit boards. 4,175,011, Cl. 204-15.000.
Spokane Crusher Manufacturing Co.: *See*—
Warren, Kenneth D.; and Tenold, Robert G., 4,174,814, Cl. 241-275.000.
Spong, Fred W.: *See*—
Credelle, Thomas L.; and Spong, Fred W., 4,174,881, Cl. 350-3.630.
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Sprung, Walter: *See*—
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Stal-Laval Turbin AB: *See*—
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Standard Oil Company: *See*—
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Chen, Stephen Y.; and Quinn, Thomas M., 4,175,071, Cl. 260-42.440.
Standard Oil Company (Indiana): *See*—
Fondriest, F. Frederick, 4,174,974, Cl. 106-103.000.
Stanley Works, The: *See*—
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Star Seimitsu Kabushiki Kaisha: *See*—
Harakawa, Mototaka; and Mitumori, Yoshio, 4,175,262, Cl. 340-388.000.
Stauffer Chemical Company: *See*—
Lusk, Edwin B.; Riley, Douglas C., Jr.; and Creadh, Joseph P., III, 4,175,112, Cl. 423-242.000.
Timony, Peter E., 4,175,045, Cl. 252-56.00S.
Stedman, Robert N., to Caterpillar Tractor Co. Material ripping vehicle. 4,174,757, Cl. 172-292.000.
Steigerwald, Karl H.: *See*—
Kappelsberger, Erwin; Anderl, Peter; and Steigerwald, Karl H., 4,175,226, Cl. 219-121.0EM.
Steigerwald Strahltechnik GmbH: *See*—
Kappelsberger, Erwin; Anderl, Peter; and Steigerwald, Karl H., 4,175,226, Cl. 219-121.0EM.
Stein, Karl-Ulrich: *See*—
Breimesser, Fritz; Kuznia, Christian; and Stein, Karl-Ulrich, 4,175,238, Cl. 307-40.000.
Steinegger, Alfred: *See*—
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Steinwart, Johannes; Maurhoff, Gerhard; and Bauder, Armin, to Audi NSU Auto Union Aktiengeselischaft. Fuel injection system having pressurized damping means. 4,174,693, Cl. 123-139.0AW.
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Stiefel, Peter: *See*—
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Stoltefuss, Jurgen: *See*—
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Striegler, John H., to Atlantic Richfield Company. Detection of drilling oil filtrate invasion in a core. 4,174,629, Cl. 73-153.000.
Strong, Philip L.; and Belles, Wayne S., to United States Borax & Chemical Corporation. Benzimidazole compounds. 4,174,959, Cl. 71-92.000.
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Sturgis, Malcolm B.; and Hammond, Harry H., to Hansen Manufacturing Company, The. Excess flow limiting valve. 4,174,731, Cl. 137-489.000.
Sturm, Winfried: *See*—
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Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., to Massachusetts Institute of Technology. Fluid mixing apparatus. 4,174,907, Cl. 366-279.000.
Sumitomo Metal Mining Company Limited: *See*—
Fujimura, Kenji, 4,175,061, Cl. 252-518.000.
Sumitomo, Yuji: *See*—
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.
Sumiyoshi, Masaharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio control device. 4,174,690, Cl. 123-119.0EC.
Sun Electric Corporation: *See*—
Swis, Philip E.; and Hill, Jere L., 4,174,627, Cl. 73-116.000.
Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,174,953, Cl. 44-1.00R.
Suominen, Heikki S. Method of forming a plastic shopping bag having a reinforced handle. 4,174,657, Cl. 93-35.00H.
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Sutton, Roger F.: *See*—
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Suverison, Lyle B., to General Motors Corporation. Electrical connector. 4,174,879, Cl. 339-217.00S.
SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See*—
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Swis, Philip E.; and Hill, Jere L., to Sun Electric Corporation. Test stand for an internal combustion engine testing system. 4,174,627, Cl. 73-116.000.
Swisher, George W., Jr., to CMI Corporation. Burner and exhaust control assemblies for use with an apparatus for conveying particulate material. 4,174,949, Cl. 432-58.000.
Swiss Aluminium Ltd.: *See*—
Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, 4,174,826, Cl. 266-227.000.
Buxmann, Kurt, 4,174,965, Cl. 75-135.000.
Garnett, Albert C., 4,174,785, Cl. 220-224.000.
Tachi, Katsuichi, to Sony Corporation. Method and apparatus of inserting an address signal in a video signal. 4,175,267, Cl. 358-4.000.
Tait, William S.; and Greenlee, Roy W., to Petrolite Corporation. Use of hydrocarbon polymers in demulsification. 4,175,054, Cl. 252-331.000.
Takahashi, Kenji: *See*—
Nagano, Hiroo; Ikeda, Chuki; Takahashi, Kenji; Kato, Naoyoshi; and Sato, Norio, 4,174,677, Cl. 118-67.000.
Takahashi, Kihei; and Terada, Seiko, to Yoshida Kogyo K.K. Apparatus for manufacturing a slide fastener stringer having a woven coiled coupling element. 4,174,736, Cl. 139-35.000.
Takano, Rikuo: *See*—
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.

Takeda Chemical Industries, Ltd.: *See*—
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Takemori, Fumio, to Akebono Brake Industry Co., Ltd. Caliper carrying structure for tilting type disc brake. 4,174,768, Cl. 188-72.300.

Takeuchi, Takashi: *See*—
Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; Takeuchi, Takashi; Moriyama, Noboru; and Fukuyama, Yukihiro, 4,175,066, Cl. 260-29.60M.

Takita, Nobuhiro; and Shintani, Tadashi, to Dainippon Screen Seizo Kabushiki Kaisha. Film squeegee mechanism of automatic film developing apparatus. 4,174,901, Cl. 354-322.000.

Takizawa, Masaaki: *See*—
Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, 4,174,679, Cl. 123-30.00D.

Tanabe Seiyaku Co., Ltd.: *See*—
Senuma, Masaru; Ishihara, Nobuhiko; Nishimoto, Shigeru; Yamato, Eisaku; and Shigematsu, Noboru, 4,175,206, Cl. 562-444.000.

Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Film advance device for cameras. 4,174,899, Cl. 354-213.000.

Tanaka, Yukio, to Showa Machine Industries Co., Ltd. Tap holder. 4,174,918, Cl. 408-139.000.

Tarkan, Stuart E.: *See*—
Mal, M. Kumar; and Tarkan, Stuart E., 4,174,967, Cl. 75-237.000.

Tatum, Joe F.; and Lewis, Thomas H., to C. E. Equipment Co., Inc. Apparatus for preventing end effect in anodes. 4,175,021, Cl. 204-196.000.

Taylor, Colin R., to Pfizer Inc. Method for treating congestive heart failure. 4,175,128, Cl. 424-263.000.

Taylor, Harry M.: *See*—
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,175,075, Cl. 260-123.500.

Teijin Seiki Company Limited: *See*—
Fukui, Kiyozumi, 4,174,763, Cl. 180-6.480.

Teitel, Robert J.: *See*—
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., 4,175,016, Cl. 204-157.10H.

Teledyne, Inc.: *See*—
Wiesler, Mordechai, 4,174,847, Cl. 279-1.00L.

Teledyne Industries, Inc.: *See*—
Campbell, Joseph M., 4,174,652, Cl. 84-1.280.

Teletype Corporation: *See*—
Fechter, Henry G., 4,175,145, Cl. 427-240.000.

Temp-Stik Corporation: *See*—
Hammerslag, Julius G., 4,174,631, Cl. 73-359.00R.

Tenneco Chemicals, Inc.: *See*—
Landau, Marvin; Bellettiere, Samuel J.; and Hoch, Samuel, 4,175,064, Cl. 260-22.0CA.

Tenold, Robert G.: *See*—
Warren, Kenneth D.; and Tenold, Robert G., 4,174,814, Cl. 241-275.000.

Teodorescu, Constantin; and Ardeleanu, Stefan, to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst. Process and plant for the continuous unloading of the heavy-duty containers in a pneumatic transport system. 4,174,921, Cl. 414-387.000.

Ter Borg & Mensinga's Machinefabriek N.V.: *See*—
van de Weerd, Berend, 4,174,718, Cl. 130-30.00J.

Terada, Seiko: *See*—
Takahashi, Kihei; and Terada, Seiko, 4,174,736, Cl. 139-35.000.

Teradyne, Inc.: *See*—
Pitegoff, Alexander D., 4,175,253, Cl. 324-62.000.

Texaco Development Corp.: *See*—
McEntire, Edward E., 4,175,097, Cl. 260-570.50P.

Texaco Inc.: *See*—
Canup, Robert E., 4,174,695, Cl. 123-148.00E.

Texas Brine Corporation: *See*—
Mondshine, Thomas C., 4,175,042, Cl. 252-8.55R.

Texas Gas Transmission Corporation: *See*—
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., 4,175,016, Cl. 204-157.10H.

Texas Instruments Incorporated: *See*—
Hunter, Arthur C.; and Norman, Lloyd E., 4,175,286, Cl. 364-737.000.
Mann, Don C., 4,175,274, Cl. 360-99.000.
Shuraym, George P., 4,175,284, Cl. 364-200.000.

Textron Inc.: *See*—
Dickinson, Thorn W., 4,174,640, Cl. 74-690.000.
Moertel, George B., 4,175,104, Cl. 264-103.000.

Thomas, Donald K., Jr. Grating opening in a working table for vertical storage. 4,174,668, Cl. 108-25.000.

Thompson, Charles W. Friction type exercise device. 4,174,832, Cl. 272-133.000.

Thompson, Gerald L.; Paschal, Gloria C.; and Conrad, Robert A., to Eli Lilly and Company. Process of producing 5'-hydroxyleurosine and related compounds. 4,175,080, Cl. 260-244.400.

Thompson, H. Lytle, to UOP Inc. Closed-loop vacuum fractionation process. 4,175,034, Cl. 208-321.000.

Thomson-CSF: *See*—
Dansac, Jean; and Couderc, Georges, 4,175,285, Cl. 364-456.000.

Thomson, John, Jr.: *See*—
Fleming, James W., Jr.; O'Bryan, Henry M., Jr.; and Thomson, John, Jr., 4,175,060, Cl. 252-518.000.

Thornburgh, William F.: *See*—
Hollis, Thomas J.; and Thornburgh, William F., 4,174,610, Cl. 60-290.000.

Tideland Signal Corporation: *See*—
Klein, William R.; and Burns, William V., 4,175,244, Cl. 313-315.000.

Timex Corporation: *See*—
Wuthrich, Paul, 4,174,607, Cl. 58-82.00A.

Timony, Peter E., to Stauffer Chemical Company. Compressor lubrication. 4,175,045, Cl. 252-56.00S.

Tishkov, Anatoly Y.: *See*—
Kreimer, Vladimir I.; Tishkov, Anatoly Y.; Grigoriev, Vitaly M.; Gendlina, Ljudmila I.; and Zimonin, Leonid V., 4,174,776, Cl. 198-771.000.

Tobler, Hugh J. Method and apparatus for supplying ingredients to a concrete mixer. 4,174,740, Cl. 141-1.000.

Tocha, Klaus, to Messer Griesheim GmbH. Apparatus for controlling the pressure of a gas in a gas line. 4,174,619, Cl. 62-52.000.

Todd, Alex: *See*—
Ross, William J.; Todd, Alex; and Verge, John P., 4,175,131, Cl. 424-272.000.

Toh, Tagao: *See*—
Iwaoka, Kazuo; Toh, Tagao; and Fukada, Minoru, 4,175,107, Cl. 422-114.000.

Tokyo Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Kamoshida, Masakazu; and Ihara, Keiichi, 4,174,567, Cl. 29-741.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Agawa, Yasushi, 4,174,626, Cl. 73-113.000.
Niwa, Kazuo; Shibagaki, Masahiro; and Horiike, Yasuhiro, 4,175,235, Cl. 250-542.000.
Wada, Toyoji, 4,175,002, Cl. 176-66.000.

Toledo Engineering Company: *See*—
Bradley, Robert O.; Knighton, Heywood J.; and Naveaux, Robert J., 4,174,948, Cl. 432-54.000.

Tolley, William K., to UOP Inc. Recovery of titanium metal values. 4,174,963, Cl. 75-101.00R.

Tolley, William K., to UOP Inc. Recovery of titanium metal values. 4,175,110, Cl. 423-83.000.

Toma, Hitoshi: *See*—
Imataki, Hiroyuki; Toma, Hitoshi; and Narita, Noboru, 4,174,883, Cl. 350-126.000.

Toppan Printing Co., Ltd.: *See*—
Abe, Takashi; Kudo, Kazuo; and Kazato, Keiji, 4,174,783, Cl. 215-1.00C.

Torbett, Edward L. Safety nozzle and rack. 4,174,810, Cl. 239-283.000.

Torres, Manuel M. Storage roller thruster device for continuous strip paper feeders. 4,174,800, Cl. 226-113.000.

Toyo Kogyo Co., Ltd.: *See*—
Shimizu, Hiroshi; and Shinohara, Masamichi, 4,174,686, Cl. 123-75.00B.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Fujii, Takashi; and Kizaki, Jiro, 4,174,786, Cl. 220-378.000.
Hori, Osamu; and Kondo, Katsumi, 4,175,144, Cl. 427-126.000.
Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, 4,174,679, Cl. 123-30.00D.
Sumiyoshi, Masaharu, 4,174,690, Cl. 123-119.0EC.

Treace, Harry T., to Richards Manufacturing Co., Inc. Myringotomy tube. 4,174,716, Cl. 128-350.00R.

Trexler, Charles H., Sr. Fuel-air supply system for internal combustion engines. 4,174,691, Cl. 123-133.000.

Triad & Associates, Inc.: *See*—
Triplett, William C.; and Morrow, Richard B. A., 4,175,263, Cl. 340-573.000.

Trigg, Leonard: *See*—
Sutton, Christopher J.; and Trigg, Leonard, 4,174,823, Cl. 248-582.000.

Triplett, William C.; and Morrow, Richard B. A., to Triad & Associates, Inc. Technique for monitoring whether an individual is moving from a particular area. 4,175,263, Cl. 340-573.000.

Trudgen, Gary A.: *See*—
Mulzet, Alfred P.; and Trudgen, Gary A., 4,174,637, Cl. 73-730.000.

Tsao, George T.; Ladisch, Michael R.; and Bose, Arindam, to Purdue Research Foundation. Acid hydrolysis of cellulose to yield glucose. 4,174,976, Cl. 127-37.000.

Tsuchihashi, Yasutaka; and Omoto, Tatsuhiko, to Olympus Optical Co., Ltd. Mounting mechanism for enclosure. 4,174,876, Cl. 339-96.000.

Tsuchiya, Takao; Akazawa, Susumu; and Murakami, Kyoichi, to Sony Corporation. Master-slave flip-flop circuit. 4,175,241, Cl. 307-262.000.

Tsukamoto, Kotaro. Silent gear wheel. 4,174,643, Cl. 74-443.000.

Tsutsui, Yuji: *See*—
Matsuyoshi, Hideaki; Shimono, Yukio; Tsutsui, Yuji; Miyuki, Shigeru; Watanabe, Takao; and Mizota, Hideaki, 4,174,761, Cl. 180-6.700.

Tsuzurahara, Mamoru: *See*—
Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro; and Oguro, Tomokatsu, 4,175,245, Cl. 315-39.710.

Tung, Wei-Ling; and Kwan, Steven. Low pressure warning tire air valve cap. 4,174,673, Cl. 116-34.00R.

Turner Quick-Lift Corporation: *See*—
Vandenberg, Ervin K., 4,174,855, Cl. 280-711.000.

Tuzson, John J., to Borg-Warner Corporation. Flow valve. 4,174,724, Cl. 137-56.000.

Udden, Per E. C.: *See*—
Linnman, Sven N. J.; Isoz, Peter; Branderud, Nils P.; and Udden, Per E. C., 4,175,255, Cl. 328-7.000.

UMC Industries, Inc.: *See*—
Woltjen, Duane W., 4,174,621, Cl. 64-29.000.

Umeyama, Kazuo: *See*—
Ohta, Hirofumi; Futami, Toshio; and Umeyama, Kazuo, 4,175,288, Cl. 365-2.000.
Unangst, Paul C.: *See*—
Brown, Richard E.; and Unangst, Paul C., 4,175,083, Cl. 260-326.12R.
Union Carbide Corporation: *See*—
Drnevich, Raymond F.; Venkataraman, Kallidaikurichi N.; and Walder, Thomas E., 4,175,041, Cl. 210-188.000.
Haines, Robert G., 4,175,135, Cl. 424-311.000.
Johnson, Robert N.; and Farnham, Alford G., 4,175,175, Cl. 528-125.000.
Kordesch, Karl V., 4,174,565, Cl. 29-623.200.
Norteman, William E., Jr., 4,175,052, Cl. 252-182.100.
Potts, James E., 4,175,177, Cl. 528-354.000.
Vadla, Jostein J.; and Wilder, Harold J., 4,175,022, Cl. 204-243.00R.
van Lier, Johannes A., 4,175,167, Cl. 429-59.000.
Union Tank Car Company: *See*—
Parsons, James D.; and Sivak, Jerome A., 4,174,741, Cl. 141-2.000.
Uniroyal, Inc.: *See*—
Hunter, Byron A.; and Barrows, Franklin H., 4,175,200, Cl. 560-1.000.
Unishkov, Vadim A.: *See*—
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
United States Borax & Chemical Corporation: *See*—
Strong, Philip L.; and Belles, Wayne S., 4,174,959, Cl. 71-92.000.
United States of America
America: *See*—
Gale, Glen R.; and Meischen, Sandra J., 4,175,133, Cl. 424-287.000.
Army: *See*—
Lucey, George K., Jr.; and Orrell, Michael G., 4,174,666, Cl. 102-216.000.
Energy: *See*—
Borkowski, Casimer J.; and Blalock, Theron V., 4,175,258, Cl. 331-78.000.
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,175,048, Cl. 252-63.500.
Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., 4,174,728, Cl. 137-240.000.
Interior: *See*—
Paulson, Danton L.; and Worthington, Robert B., 4,174,937, Cl. 425-222.000.
Walkiewicz, John W., 4,174,966, Cl. 75-170.000.
National Aeronautics and Space Administration: *See*—
Gruber, Robert P., 4,175,249, Cl. 323-15.000.
Navy: *See*—
Arena, John P.; McGuigan, Charles G.; and Rossi, Gene A., 4,174,843, Cl. 277-3.000.
Wilson, Jeffrey V.; Schaefer, James H.; Glowacz, Anthony A.; and Bayha, Jack, 4,174,875, Cl. 339-91.00P.
U.S. Philips Corporation: *See*—
Cousin, Alain, 4,174,841, Cl. 274-1.00L.
Klomp, Franciscus M.; and van Kruijsdijk, Josephus H., 4,174,778, Cl. 206-303.000.
Koel, Gerrit J.; and Gerkema, Jan, 4,175,010, Cl. 204-15.000.
Mixner, Ingomar, 4,174,568, Cl. 30-34.100.
Nederlof, Anton M.; and Asselman, George A. A., 4,174,616, Cl. 60-517.000.
Wehler, Herbert, 4,174,908, Cl. 400-56.000.
United Technologies Corporation: *See*—
Goller, Glen J.; Petraglia, Vincent J.; and Salonia, Joseph R., 4,175,055, Cl. 252-425.300.
Jalbert, Henry A., 4,174,950, Cl. 432-6.000.
Smith, Peter W.; and Mastrioanni, Rudolph G., 4,175,257, Cl. 330-287.000.
University of Chicago: *See*—
Fried, Josef, 4,175,201, Cl. 560-17.000.
University of Delaware: *See*—
Heck, Richard F., 4,175,187, Cl. 544-170.000.
University of Minnesota, The Regents of the: *See*—
Olson, Leslie C., 4,174,816, Cl. 242-47.500.
University of Utah: *See*—
Janata, Jiri; and McBride, Paul T., 4,175,020, Cl. 204-195.00B.
University of Virginia: *See*—
Hunt, Donald F.; and Shabanowitz, Jeffrey, 4,175,234, Cl. 250-427.000.
UOP Inc.: *See*—
Antos, George J., 4,175,031, Cl. 208-138.000.
Antos, George J., 4,175,032, Cl. 208-139.000.
Antos, George J., 4,175,056, Cl. 252-441.000.
Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., 4,175,152, Cl. 428-242.000.
Hilfman, Lee, 4,175,033, Cl. 208-143.000.
Imai, Tamotsu, 4,175,058, Cl. 252-455.00R.
Thompson, H. Lytle, 4,175,034, Cl. 208-321.000.
Tolley, William K., 4,174,963, Cl. 75-101.00R.
Tolley, William K., 4,175,110, Cl. 423-83.000.
Upjohn Company, The: *See*—
Nelson, Norman A., 4,175,202, Cl. 560-53.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,175,006, Cl. 435-55.000.
Uskokovic, Milan R.: *See*—
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,175,086, Cl. 549-51.000.
USM Corporation: *See*—
Ikins, Thomas G., 4,175,156, Cl. 428-336.000.
Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., to United States of America, Energy. Sliding-gate valve. 4,174,728, Cl. 137-240.000.
Utility Contracting Co.: *See*—
Van Den Bergh, William, 4,174,678, Cl. 118-307.000.
Vadla, Jostein J.; and Wilder, Harold J., to Union Carbide Corporation. Electrolytic cell bottom barrier formed from expanded graphite. 4,175,022, Cl. 204-243.00R.
Valente, Domenico. Pneumatic apparatus for the rotation of valve rods. 4,174,655, Cl. 92-122.000.
Valyi, Emery I. Apparatus for the preparation of hollow plastic articles. 4,174,934, Cl. 425-112.000.
Van Dalen, Dirk J.: *See*—
LeGrand, Pierre N.; and Van Dalen, Dirk J., 4,174,623, Cl. 72-34.000.
van de Krogt, Adrianus H.: *See*—
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased, 4,174,628, Cl. 73-151.000.
Vandenberg, Ervin K., to Turner Quick-Lift Corporation. Wheeled vehicle axle suspension system. 4,174,855, Cl. 280-711.000.
Van Den Bergh, William, to Utility Contracting Co. Cable spraying apparatus. 4,174,678, Cl. 118-307.000.
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., to Janssen Pharmaceutica N.V. Antiemetic 1-(benzoxazolylalkyl)-piperidine derivatives. 4,175,129, Cl. 424-267.000.
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased (by Drinkwaard, Adriana, nee Goossen, personal representative), to Shell Oil Company. Marine riser measuring joint. 4,174,628, Cl. 73-151.000.
Van der Aa, Marcel J. M. C.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,175,129, Cl. 424-267.000.
Vanderpool, Clarence D., to GTE Sylvania Incorporated. Coated phosphors and articles employing same. 4,175,160, Cl. 428-407.000.
van de Weerd, Berend, to Ter Borg & Mensinga's Machinefabriek N.V. Rub-threshing machine. 4,174,718, Cl. 130-30.00J.
Van Heertum, Albert H. M. Th.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,175,129, Cl. 424-267.000.
van Kruijsdijk, Josephus H.: *See*—
Klomp, Franciscus M.; and van Kruijsdijk, Josephus H., 4,174,778, Cl. 206-303.000.
van Lier, Johannes A., to Union Carbide Corporation. Electrode having polytetrafluoroethylene powder dispersed on its outer surface. 4,175,167, Cl. 429-59.000.
van Soldt, Nicolaas J.: *See*—
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased, 4,174,628, Cl. 73-151.000.
Vaughan, David E. W.: *See*—
Edwards, Grant C.; Vaughan, David E. W.; and Albers, Edwin W., 4,175,059, Cl. 252-455.00Z.
Venkataraman, Kallidaikurichi N.: *See*—
Drnevich, Raymond F.; Venkataraman, Kallidaikurichi N.; and Walder, Thomas E., 4,175,041, Cl. 210-188.000.
Venzke, Charles E., to A-T-O Inc. Sortation conveyor tip-up and mounting apparatus. 4,174,773, Cl. 198-365.000.
Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See*—
Kasper, Erich, 4,175,227, Cl. 219-125.120.
Verge, John P.: *See*—
Ross, William J.; Todd, Alex; and Verge, John P., 4,175,131, Cl. 424-272.000.
Vermeer Manufacturing Company: *See*—
Mathes, Arnold; Person, Norman D.; and Vermeer, Stanley J., 4,174,661, Cl. 100-5.000.
Vermeer, Stanley J.: *See*—
Mathes, Arnold; Person, Norman D.; and Vermeer, Stanley J., 4,174,661, Cl. 100-5.000.
Viefhaus, Paul: *See*—
Spicka, Roland; Krob, Adolf; Seidel, Detlev; and Viefhaus, Paul, 4,174,854, Cl. 280-702.000.
Viertel, Lothar; and Nowak, Manfred, to Gebr. Happich GmbH. Lighted sun visor for vehicles. 4,174,864, Cl. 296-97.00H.
Villers, Roger L.: *See*—
Martin, Virgil B.; and Villers, Roger L., 4,174,642, Cl. 74-243.00R.
Visbach, Dirk M., to B.V. Neratoom. Method of temporarily sealing open ends of fluid conduits terminating in a header space. 4,174,735, Cl. 138-97.000.
Vistins, Maris, to Becton, Dickinson and Company. Textured apron. 4,174,542, Cl. 2-48.000.
Vivian, Howard C. High efficiency variable expansion ratio engine. 4,174,683, Cl. 123-48.00C.

Volent, Ivan: *See—*
Fermaglich, Saul; and Volent, Ivan, 4,174,895, Cl. 354-76.000.

von Schulthess, Gustav K.: *See—*
Cannell, David S.; Giglio, Marzio; Benedek, George B.; von Schulthess, Gustav K.; and Cohen, Richard J., 4,174,952, Cl. 23-230.00B.

Vyzkumny ustav bavlnarsky: *See—*
Pallay, Eduard, 4,174,605, Cl. 57-58.890.

W. R. Grace & Co.: *See—*
Edwards, Grant C.; Vaughan, David E. W.; and Albers, Edwin W., 4,175,059, Cl. 252-455.00Z.
Gaudette, Roger R., 4,175,198, Cl. 548-308.000.

Wada, Kenichi: *See—*
Murasaki, Hiroshi; Enoguchi, Yuji; Wada, Kenichi; and Fujiwara, Takao, 4,174,904, Cl. 355-8.000.

Wada, Toyoji, to Tokyo Shibaura Electric Co., Ltd. Nuclear fuel pellet with oppositely bottomed holes. 4,175,002, Cl. 176-66.000.

Wagener, Earl H.: *See—*
Harris, Robert F.; and Wagener, Earl H., 4,175,196, Cl. 546-339.000.

Wagner, Karl-Heinz: *See—*
Auchter, Bruno; Wagner, Karl-Heinz; Glimm, Gunter; and Preiss, Manfred, 4,174,791, Cl. 222-333.000.

Walden, John: *See—*
Munday, Theodore F.; and Walden, John, 4,175,111, Cl. 423-210.000.

Walder, Thomas E.: *See—*
Drnevich, Raymond F.; Venkataraman, Kallidaikurichi N.; and Walder, Thomas E., 4,175,041, Cl. 210-188.000.

Walker, Brooks; and Williamson, James. Pile sizer. 4,174,746, Cl. 144-134.00R.

Walkiewicz, John W., to United States of America, Interior. High coercive force rare earth metal-cobalt magnets containing copper and magnesium. 4,174,966, Cl. 75-170.000.

Wallace Murray Corporation: *See—*
Smithson, Charles L., Jr., 4,174,924, Cl. 416-132.00A.

Wallis, Bernard J. Punch retainer. 4,174,648, Cl. 83-698.000.

Walsh, James E.: *See—*
Daly, Thomas W.; Hoer, Ralph A.; Walsh, James E.; and James, Henry T., 4,174,975, Cl. 106-161.000.

Ward, Gene T.: *See—*
Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., 4,174,728, Cl. 137-240.000.

Warkentin, James D.: *See—*
Rasheed, Khalid; and Warkentin, James D., 4,175,186, Cl. 544-145.000.

Warner-Lambert Company: *See—*
Brown, Richard E.; and Unangst, Paul C., 4,175,083, Cl. 260-326.12R.

Warner, Terry N.: *See—*
Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., 4,174,728, Cl. 137-240.000.

Warren, Kenneth D.; and Tenold, Robert G., to Spokane Crusher Manufacturing Co. Impeller shoe for centrifugal impact rock crushing machine. 4,174,814, Cl. 241-275.000.

Washiyama, Yutaka: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Watanabe, Hironori; Kondo, Tatsunori; Kugisawa, Toshio; and Washiyama, Yutaka, 4,174,649, Cl. 84-1.010.

Wassermann, Martin; Noweck, Klaus; and Meyer, Arnold, to Condea Chemie GmbH. Method for manufacturing a high porous alumina having a large surface area and a low bulk density. 4,175,118, Cl. 423-628.000.

Wasterlain, Michel: *See—*
De Boel, Marcel; Baudin, Pol; Wasterlain, Michel; and Collignon, Pierre, 4,175,162, Cl. 428-428.000.

Watanabe, Hironori: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Watanabe, Hironori; Kondo, Tatsunori; Kugisawa, Toshio; and Washiyama, Yutaka, 4,174,649, Cl. 84-1.010.

Watanabe, Takao: *See—*
Matsuyoshi, Hideaki; Shimono, Yukio; Tsutsui, Yuji; Miyuki, Shigeru; Watanabe, Takao; and Mizota, Hideaki, 4,174,761, Cl. 180-6.700.

Watkins, Dale F.: *See—*
Belvin, David S.; Perry, Clifford R.; and Watkins, Dale F., 4,174,987, Cl. 156-197.000.

Watson, Gary Q. Anchor eye protector. 4,174,595, Cl. 52-166.000.

Waymouth, John F.: *See—*
Newell, P. Bruce; Morris, James C.; and Waymouth, John F., 4,174,944, Cl. 431-359.000.

Webb, Bryant F.; and Parrish, Charles A., to Sperry Rand Corporation. Header suspension and stabilization means. 4,174,602, Cl. 56-208.000.

Webb, Jack; and Schwartz, Stanley L., to Hydrosoil Corporation. Synthetic growing medium and method of preparing it. 4,174,957, Cl. 71-24.000.

Weber, Adam: *See—*
Mutschler, Erich; and Weber, Adam, 4,174,764, Cl. 180-78.000.

Weber, Theo: *See—*
Kusebauch, Walter; Kostka, Hana; Henkel, Hans-Joachim; Koch, Christian; de Bucs, Eugen S.; and Weber, Theo, 4,174,954, Cl. 48-212.000.

Wedmore, William R., to GTE Automatic Electric Laboratories Incorporated. Apparatus and method for a pulse regeneration system. 4,175,214, Cl. 179-15.0BW.

Wehler, Herbert, to U.S. Philips Corporation. Printer comprising a printing head controlled by a sensor. 4,174,908, Cl. 400-56.000.

Weineck, Paul: *See—*
Kispert, Klaus; Manger, Werner; and Weineck, Paul, 4,174,870, Cl. 308-217.000.

Weisenborn, Frank L.: *See—*
Ondetti, Miguel A.; and Weisenborn, Frank L., 4,175,199, Cl. 548-336.000.

Weiss, C. David: *See—*
Frantzreb, John G., Sr.; and Weiss, C. David, 4,174,962, Cl. 75-53.000.

Weissler, Alain. Optical viewer with adjustable angular convergence. 4,174,884, Cl. 350-138.000.

Wells, Thomas R.: *See—*
Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,174,890, Cl. 353-26.00A.

Welty, Kenneth B.: *See—*
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Wessel, Wolf; Stumpp, Gerhard; and Knapp, Heinrich, to Robert Bosch GmbH. Fuel injection device. 4,174,692, Cl. 123-139.0AW.

Wessel, Wolf; and Sautter, Wilfried, to Robert Bosch GmbH. Fuel injection control system. 4,174,694, Cl. 123-140.0MC.

West, John B., to Maryland Cup Corporation. Soup dispenser. 4,174,789, Cl. 222-240.000.

West Rand Engineering Works (Proprietary) Limited: *See—*
Kramer, Petrus H., 4,174,767, Cl. 184-55.00A.

Western Electric Company, Incorporated: *See—*
Partus, Fred P., 4,174,842, Cl. 277-3.000.

Western Marine Electronics, Inc.: *See—*
Blakey, Bruce H.; and Pohl, Douglas R., 4,174,703, Cl. 126-430.000.

Westinghouse Electric Corp.: *See—*
Beuchel, Peter H.; and Cooper, Eric G., 4,175,003, Cl. 176-76.000.
Burns, David C., 4,174,999, Cl. 176-19.00R.
Cellier, Francis, 4,174,938, Cl. 425-317.000.
Johnston, Robert J.; Layciak, Stephen G.; and Dobrosielski, Stephen S., 4,175,220, Cl. 200-4.000.
Kellogg, Walter J., 4,175,221, Cl. 200-4.000.

Westvaco Corporation: *See—*
Shepard, Michael L., 4,174,576, Cl. 33-181.00R.

Wetterlin, Kjell I. L.: *See—*
Moren, Nils F. E.; and Wetterlin, Kjell I. L., 4,174,712, Cl. 128-173.00R.

Wetzel, Alvin L. Wheelbarrow type carrier. 4,174,849, Cl. 280-47.300.

Wetzler, Justin J. Hospital bed structure. 4,174,547, Cl. 5-68.000.

Whatman Inc.: *See—*
Benney, Charles H.; and Filipi, Thomas J., 4,175,037, Cl. 210-31.00C.

Whirlpool Corporation: *See—*
Bunnell, Douglas E.; Gauer, Joseph A.; Sherer, R. Bruce; and Scott, William F., 4,174,622, Cl. 68-23.300.

White, Douglas J., to Bio-Pharmaceutical Packaging Corp. Culture specimen collection and transport package. 4,175,008, Cl. 435-295.000.

White-Westinghouse Corporation: *See—*
Long, Olan L., 4,174,723, Cl. 134-144.000.

Whitfield, Dwight B.; and Ferryman, Kenneth K., Jr., to Lake Center Industries. Electric power actuator. 4,175,248, Cl. 318-467.000.

Wiesler, Mordechai, to Teledyne, Inc. Precision centering device. 4,174,847, Cl. 279-1.00L.

Wiewiorowski, Edward I.: *See—*
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Yu, Peter H., 4,175,014, Cl. 204-130.000.

Wilcox, Thomas J.: *See—*
Arnold, Don C.; Silletti, Julio D.; Ritzenthaler, Richard L.; and Wilcox, Thomas J., 4,174,726, Cl. 137-100.000.

Wilder, Harold J.: *See—*
Vadla, Jostein J.; and Wilder, Harold J., 4,175,022, Cl. 204-243.00R.

Wilgus, Donovan R.; and King, John M., to Chevron Research Company. Mannich base composition and lubricating oil compositions containing same. 4,175,044, Cl. 252-42.700.

Willbanks, Charles E., to Milliken Research Corporation. Blade for sculpturing pile fabric. 4,174,555, Cl. 26-16.000.

Willbanks, Charles E.: *See—*
Arnott, Robert C.; and Willbanks, Charles E., 4,174,664, Cl. 101-127.000.

Wm. Wrigley Jr. Company: *See—*
Hupalowsky, Joseph, 4,174,781, Cl. 211-49.00D.

Williams, Lewis M. Telephone headset. 4,175,217, Cl. 179-156.00R.

Williams, Robert E.: *See—*
Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000.

Williams, Roy K., to International Telephone and Telegraph Corporation. Safety system for hydraulic vertical press. 4,174,663, Cl. 100-53.000.

Williamson, Glen A. Wind driven engine. 4,174,923, Cl. 415-2.000.

Williamson, James: *See—*
Walker, Brooks; and Williamson, James, 4,174,746, Cl. 144-134.00R.

Williamson, Timothy J.: *See—*
Benton, Kenneth C.; and Williamson, Timothy J., 4,175,101, Cl. 525-88.000.

Wilson, David J., Jr.: *See*—
Wilson, David J., Sr.; and Wilson, David J., Jr., 4,174,604, Cl. 56-237.000.
Wilson, David J., Sr.; and Wilson, David J., Jr. Hedge trimmer apparatus. 4,174,604, Cl. 56-237.000.
Wilson, Jeffrey V.; Schaefer, James H.; Glowacz, Anthony A.; and Bayha, Jack, to United States of America, Navy. Coaxial wet connector with spring operated piston. 4,174,875, Cl. 339-91.00P.
Windmoller & Holscher: *See*—
Bosse, Frank, 4,174,804, Cl. 229-55.000.
Wirth, Friedhelm: *See*—
Gelsdorf, Gunter; and Wirth, Friedhelm, 4,174,970, Cl. 106-44.000.
Wisowaty, Sigmund. Storage receptacle. 4,174,793, Cl. 224-240.000.
Woerner, Douglas C.: *See*—
Faust, Kenneth J.; and Woerner, Douglas C., 4,175,154, Cl. 428-313.000.
Wolfs, Andreas G. J.; and Goessens, Lambertus H., to Eerste Nederlandse Cement Industrie (ENCI) N.V.; and C.B.R. Cementbedrijven N.V., a part interest to each. Method for working-up waste slag from the oxygen steel production. 4,174,961, Cl. 75-30.000.
Woltjen, Duane W., to UMC Industries, Inc. Torque limiting overload coupling. 4,174,621, Cl. 64-29.000.
Wonsiewicz, Bud C.: *See*—
Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., 4,174,983, Cl. 148-102.000.
Woo, Kenneth: *See*—
Feinberg, Albert E.; and Woo, Kenneth, 4,175,246, Cl. 315-101.000.
Woods, Lee O., to General Electric Company. Relay device, methods of assembling and mounting, and system. 4,175,260, Cl. 335-202.000.
World Energy Systems: *See*—
Hamrick, Joseph T.; and Rose, Leslie C., 4,174,926, Cl. 417-334.000.
Worthington, Robert B.: *See*—
Paulson, Danton L.; and Worthington, Robert B., 4,174,937, Cl. 425-222.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., to Upjohn Company, The. Composition of matter and process. 4,175,006, Cl. 435-55.000.
Wozniak, Walter J.: *See*—
Breslow, Jeffrey D.; Ferris, Michael J.; Arias, Henry; and Wozniak, Walter J., 4,174,835, Cl. 273-101.000.
Wuchse, Gunther R., to Alfa-Laval AB. Apparatus for cleaning milking systems. 4,174,721, Cl. 134-58.00R.
Wulff, Gunther, to Balzers Patent- und Beteiligungs Aktiengesellschaft. Metering device for a vacuum deposition apparatus. 4,174,676, Cl. 118-688.000.
Wurst, Bert: *See*—
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.
Wust, Willi: *See*—
Carduck, Franz-Josef; Klotzer, Dietrich; Schneider, Werner; and Wust, Willi, 4,175,050, Cl. 252-91.000.
Wuthrich, Paul, to Timex Corporation. Mechanism for self-wind watches. 4,174,607, Cl. 58-82.00A.
Xerox Corporation: *See*—
Snelling, Christopher, 4,174,903, Cl. 355-3.0CH.
Yamada, Shigeru: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,174,650, Cl. 84-1.010.
Yamamoto, Tomio: *See*—
Yasue, Setsuo; and Yamamoto, Tomio, 4,174,797, Cl. 224-42.210.
Yamamoto, Yoichi: *See*—
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.
Yamanaka, Seisuke: *See*—
Ochi, Shigeyuki; Yamazaki, Hiroshi; and Yamanaka, Seisuke, 4,175,268, Cl. 358-44.000.
Yamanaka, Tsutomu; Yasuda, Hiroshi; and Osuga, Kunio, to Yoshitomi Pharmaceutical Industries, Ltd. Oxazole- and thiazole-alkanoic acid compounds. 4,175,130, Cl. 424-270.000.
Yamato, Eisaku: *See*—
Senuma, Masaru; Ishihara, Nobuhiko; Nishimoto, Shigeru; Yamato, Eisaku; and Shigematsu, Noboru, 4,175,206, Cl. 562-444.000.
Yamatsu, Isao: *See*—
Kijima, Shizumasa; Yamatsu, Isao; Inai, Yuichi; Igarashi, Toshiji; Nakajima, Yoshikage; and Eisai Co., Ltd., 4,175,139, Cl. 424-343.000.
Yamazaki, Hiroshi: *See*—
Ochi, Shigeyuki; Yamazaki, Hiroshi; and Yamanaka, Seisuke, 4,175,268, Cl. 358-44.000.
Yan, Tsoung-Yuan: *See*—
Chen, Nai Y.; and Yan, Tsoung-Yuan, 4,175,211, Cl. 585-241.000.
Yarbrough, Paul A.: *See*—
Senior, Robert B.; and Yarbrough, Paul A., 4,174,560, Cl. 29-566.100.
Yasuda, Hiroshi: *See*—
Yamanaka, Tsutomu; Yasuda, Hiroshi; and Osuga, Kunio, 4,175,130, Cl. 424-270.000.
Yasue, Setsuo; and Yamamoto, Tomio, to Sankokiki Kabushiki Kaisha. Spare wheel holding apparatus. 4,174,797, Cl. 224-42.210.
Yohe, William R.: *See*—
Ferguson, Sammy J.; and Yohe, William R., 4,174,995, Cl. 156-494.000.
Yokota, Sekiji: *See*—
Fujii, Toshihiro; and Yokota, Sekiji, 4,174,992, Cl. 156-244.110.
Fujii, Toshihiro; and Yokota, Sekiji, 4,174,993, Cl. 156-244.110.
Yoo, Jin S.: *See*—
Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., 4,174,953, Cl. 44-1.00R.
Yoshida Kogyo K.K.: *See*—
Oogami, Eiryo, 4,174,590, Cl. 49-504.000.
Takahashi, Kihei; and Terada, Seiko, 4,174,736, Cl. 139-35.000.
Yoshimori, Ikuo: *See*—
Goto, Yukio; Nakai, Osamu; and Yoshimori, Ikuo, 4,174,557, Cl. 29-157.10R.
Yoshino Kogyosho Co., Ltd.: *See*—
Nozawa, Takamitsu; Goto, Takayuki; Kishi, Takao; and Iizuka, Shigeo, 4,174,790, Cl. 222-321.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Yamanaka, Tsutomu; Yasuda, Hiroshi; and Osuga, Kunio, 4,175,130, Cl. 424-270.000.
Youngquist, Rudolph W.: *See*—
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,175,075, Cl. 260-123.500.
Youtsey, Karl J.: *See*—
Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., 4,175,152, Cl. 428-242.000.
Yu, Peter H.: *See*—
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Yu, Peter H., 4,175,014, Cl. 204-130.000.
Zabler, Erich; Jansche, Walter; and Heintz, Frieder, to Robert Bosch GmbH. Pressure pickup for measuring the pressure in the intake manifold of an internal combustion engine. 4,174,638, Cl. 73-728.000.
Zadde, Vitaly V.: *See*—
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
Zahn, Ulrich. Recording device for the dispensing of goods. 4,174,806, Cl. 235-381.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Liebert, Karl-Heinz, 4,174,612, Cl. 60-384.000.
Zatravina, Valentina V.: *See*—
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
Zechnall, Martin: *See*—
Honig, Guenther; Kiencke, Uwe; and Zechnall, Martin, 4,174,688, Cl. 123-117.00D.
Zeller, Paul: *See*—
Binder, Dieter; Hromatka, Otto; Pfister, Rudolf; and Zeller, Paul, 4,175,085, Cl. 549-65.000.
Zenzefilis, George E. Method and apparatus for recording and reproducing video. 4,175,270, Cl. 358-128.000.
Zettelmeyer Maschinenfabrick GmbH & Co. KG Konz: *See*—
Spicka, Roland; Krob, Adolf; Seidel, Detlev; and Viefhaus, Paul, 4,174,854, Cl. 280-702.000.
Zhuravleva, Larisa L.: *See*—
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
Zimmerman, Dennis M., to Eli Lilly and Company. 1,3,4-Trisubstituted-4-aryl-1,4,5,6-tetra-hydropyridines. 4,175,197, Cl. 546-339.000.
Zimmerman, Sheldon B.; and Chalmers, John H., Jr., to Merck & Co., Inc. Process for producing antibiotic A21A. 4,175,007, Cl. 435-105.000.
Zimonin, Leonid V.: *See*—
Kreimer, Vladimir I.; Tishkov, Anatoly Y.; Grigoriev, Vitaly M.; Gendlina, Ljudmila I.; and Zimonin, Leonid V., 4,174,776, Cl. 198-771.000.
Zobens, Arthur, to Crane Packing Company. Mechanical seal. 4,174,844, Cl. 277-85.000.
Zoller, Karl: *See*—
Merkle, Hans; Mueller, Albrecht; and Zoller, Karl, 4,175,184, Cl. 544-10.000.
Zuk, Paul, to Bell Telephone Laboratories, Incorporated. Voltage surge protector. 4,175,277, Cl. 361-120.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF NOVEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See—*
Gustafson, William R., Re. 30,155, Cl. 208-216.0PP.
Bose Corporation: *See—*
Jarvis, Arthur B., Re. 30,154, Cl. 403-290.000.
Brinckmann, Paul C., to Harshaw Chemical Company, The. Sodium activated cesium iodide scintillator. Re. 30,156, Cl. 252-301.40H.
Bucklin, James B.; and Utken, Jay, to P. R. Mallory & Co. Inc. Fusing resistor. Re. 30,158, Cl. 337-166.000.
Burress, George T., to Mobil Oil Corporation. Xylene isomerization. Re. 30,157, Cl. 585-411.000.
Busch, Thomas N.; and Hoadley, Cyrus E., to Youngstown Sheet and Tube Company. Tree harvester. Re. 30,153, Cl. 144-3.00D.
Davis, Lewis K., to Deere & Company. Swingable shield assembly for tractor power take-off. Re. 30,152, Cl. 64-32.00R.
Deere & Company: *See—*
Davis, Lewis K., Re. 30,152, Cl. 64-32.00R.
Gustafson, William R., to American Cyanamid Company. Hydrotreating of petroleum distillates using shaped catalyst particles. Re. 30,155, Cl. 208-216.0PP.
Harris-Hub Co., Inc.: *See—*
Nowell, Richard A., Re. 30,151, Cl. 5-181.000.
Harshaw Chemical Company, The: *See—*
Brinckmann, Paul C., Re. 30,156, Cl. 252-301.40H.
Hoadley, Cyrus E.: *See—*
Busch, Thomas N.; and Hoadley, Cyrus E., Re. 30,153, Cl. 144-3.00D.
Jarvis, Arthur B., to Bose Corporation. Joining. Re. 30,154, Cl. 403-290.000.
Mobil Oil Corporation: *See—*
Burress, George T., Re. 30,157, Cl. 585-411.000.
Nowell, Richard A., to Harris-Hub Co., Inc. Adjustable bed-frame. Re. 30,151, Cl. 5-181.000.
P. R. Mallory & Co. Inc.: *See—*
Bucklin, James B.; and Utken, Jay, Re. 30,158, Cl. 337-166.000.
Utken, Jay: *See—*
Bucklin, James B.; and Utken, Jay, Re. 30,158, Cl. 337-166.000.
Youngstown Sheet and Tube Company: *See—*
Busch, Thomas N.; and Hoadley, Cyrus E., Re. 30,153, Cl. 144-3.00D.

LIST OF PLANT PATENTEES

Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,487, 11-20-79, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,488, 11-20-79, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,489, 11-20-79, Cl. 49.000.
Reiter, J. Miles. Raspberry plant. 4,485, 11-20-79, Cl. 46.000.
Reiter, J. Miles. Raspberry plant. 4,486, 11-20-79, Cl. 46.000.
University of California, The Regents of the: *See—*
Bringhurst, Royce S.; and Voth, Victor, 4,487, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, 4,488, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, 4,489, Cl. 49.000.
Voth, Victor: *See—*
Bringhurst, Royce S.; and Voth, Victor, 4,487, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, 4,488, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, 4,489, Cl. 49.000.

LIST OF DESIGN PATENTEES

A - Betong AB: *See—*
Limmergard, Sten; and Thim, Stig H. G., 253,491, Cl. D25-74.000.
Abruzzo, Joseph, Jr., to Holson Company, The. Photograph album. 253,482, 11-20-79, Cl. D19-26.000.
Action Industries, Inc.: *See—*
Salladay, Mack, 253,448, Cl. D6-256.000.
Ailes, William B., II. Planter or similar article. 253,463, 11-20-79, Cl. D11-143.000.
Airwick Industries, Inc.: *See—*
Hoyt, Earl, 253,488, Cl. D23-150.000.
Hoyt, Earl, 253,489, Cl. D23-150.000.
American Optical Corporation: *See—*
Canavan, Richard W., III, 253,477, Cl. D16-65.000.
Canavan, Richard W., III, 253,478, Cl. D16-65.000.
Canavan, Richard W., III, 253,481, Cl. D16-65.000.
Johnsen, David W., 253,479, Cl. D16-65.000.
Johnsen, David W., 253,480, Cl. D16-65.000.
Winig, Stephen U., 253,442, Cl. D6-162.000.
Winig, Stephen U., 253,446, Cl. D6-235.000.
Ashe, Herbert J.: *See—*
Sit-Lac, Yeung, 253,494, Cl. D48-24.00A.
Astatic Corporation, The: *See—*
Peterson, Donald W., 253,468, Cl. D14-12.000.
Augurt, Thomas A., to Propper Manufacturing Co., Inc. Sterilization indicator. 253,492, 11-20-79, Cl. D24-99.000.
Barbee, Marvin L.: *See—*
Butcher, Donald A.; and Barbee, Marvin L., 253,450, Cl. D6-157.000.
Beder, Samuel L., to Le-Bo Products Company, Inc. Record rack. 253,443, 11-20-79, Cl. D6-185.000.
Beene, Geoffrey, to Geoffrey Beene, Inc. Bottle. 253,455, 11-20-79, Cl. D9-145.000.
Bodine, Dale P., to Clark Equipment Company. Electric lamp housing for vehicles. 253,495, 11-20-79, Cl. D48-32.00R.
Bon-Aire Industries, Inc.: *See—*
Tack, Suen S., 253,452, Cl. D7-164.000.
Bothun, Eugene L.; and Cannon, Thomas G., to Clarke-Gravely Corporation. Carpet cleaner. 253,471, 11-20-79, Cl. D15-53.000.
Bothun, Eugene L.: *See—*
Cannon, Thomas G.; and Bothun, Eugene L., 253,472, Cl. D15-54.000.
Bridgeport Metal Goods Manufacturing Company, The: *See—*
White, John C., 253,460, Cl. D9-168.000.
Bridgestone Tire Company Limited: *See—*
Ezura, Sakae; and Kojima, Hiroshi, 253,467, Cl. D12-147.000.
Kojima, Hiroshi; Takayama, Masahiro; and Nishio, Hideaki, 253,466, Cl. D12-141.000.
Butcher, Donald A.; and Barbee, Marvin L., to Marquette Electronics, Inc. Fabric display rack. 253,450, 11-20-79, Cl. D6-157.000.
Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 253,477, 11-20-79, Cl. D16-65.000.
Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 253,478, 11-20-79, Cl. D16-65.000.
Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 253,481, 11-20-79, Cl. D16-65.000.
Cannon, Thomas G.; and Bothun, Eugene L., to Clarke-Gravely Corporation. Vacuum cleaner. 253,472, 11-20-79, Cl. D15-54.000.
Cannon, Thomas G.: *See—*
Bothun, Eugene L.; and Cannon, Thomas G., 253,471, Cl. D15-53.000.
Champion International Corporation: *See—*
Dempster, Thomas B., 253,461, Cl. D9-245.000.
Chaykin, Robert L. Grinding wheel. 253,474, 11-20-79, Cl. D15-126.000.
Clark Equipment Company: *See—*
Bodine, Dale P., 253,495, Cl. D48-32.00R.

Clarke-Gravely Corporation: *See—*
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Cannon, Thomas G.; and Bothun, Eugene L., 253,472, Cl. D15-54.000.

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Hasegawa, Gary K.; and Mascia, Carmen T., 253,459, Cl. D9-131.000.

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Ezura, Sakae; and Kojima, Hiroshi, to Bridgestone Tire Company Limited. Vehicle tire. 253,467, 11-20-79, Cl. D12-147.000.

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Johnsen, David W., to American Optical Corporation. Spectacles frame front. 253,479, 11-20-79, Cl. D16-65.000.

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Lynn, George, to W. H. Brine Company. Protective sports helmet. 253,436, 11-20-79, Cl. D2-232.000.

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Ng, Win. Butter warmer. 253,451, 11-20-79, Cl. D7-125.000.

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Peterson, Donald W., to Astatic Corporation, The. Microphone. 253,468, 11-20-79, Cl. D14-12.000.

Prevost, Jean. Easy chair. 253,439, 11-20-79, Cl. D6-67.000.

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Salladay, Mack, to Action Industries, Inc. Pants hanger. 253,448, 11-20-79, Cl. D6-256.000.

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Thompson, Bruce R., to United Packages Limited. Hand basin. 253,487, 11-20-79, Cl. D23-58.000.

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White, John C., to Bridgeport Metal Goods Manufacturing Company, The. Cosmetic container. 253,460, 11-20-79, Cl. D9-168.000.

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CLASSIFICATION OF PATENTS

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